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Action Education in Land Use Decisions: Student Views on Urbanization And Farmland Loss

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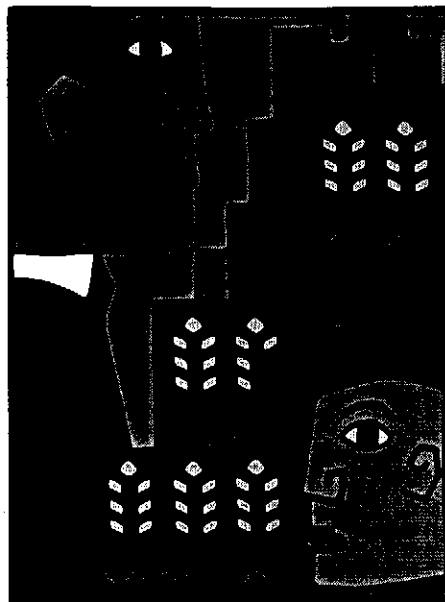
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EXTENSION AND EDUCATION
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SUSTAINABLE AGRICULTURE:

Volume 13

**Action Education
in Land Use Decisions:
Student Views on Urbanization
And Farmland Loss**



Mindi Schneider, Charles Francis, and Dick Esseks
Editors

June 2003

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Action Education in Land Use Decisions: Student Views on Urbanization and Farmland Loss

Editors' Introduction

Loss of prime farmland is a serious concern in the U.S. and around the globe. With rapid urban population increases, the activities and perceived needs of concentrated groups of people result in the swallowing of some of the most fertile lands in this country. Today we have just under 2 acres of productive farmland per person in the U.S.. Given the current population growth rate due to births and immigration, plus the present rate of farmland loss, WorldWatch Institute estimates that we will have about 0.6 acres or one-third as much farmland available per person by 2055 - a mere two generations in the future. They further calculate that we need at least 1.2 acres per person to sustain production that supports our own population, without any exports. To make matters worse, our "consumption" of farmland for other uses is accelerating faster than population growth.

The loss of farmland is not generally perceived as a problem in Nebraska where open space seems limitless. We see the endless fields of corn and soybeans across the state; the large sections filled with wheat in the Panhandle; and the subtle beauty of the Sandhill grazing lands, and cannot conceive of a land shortage. "That may be a problem in Connecticut or California, but surely not in Nebraska?" These perceptions are coupled with the ideas that yields are constantly increasing, and that GMOs will solve all of our future food problems. Still there are those that decry the loss of farmland and wildlife habitat, warning that the conversion of rural landscapes to human structures and activities totally negate their potential for ecological functions and services. So, **What is the truth about the future?**

Within this context, a course, *Urbanization of Rural Landscapes* was introduced into our curriculum at UNL in 1999. Taught by Richard Olson and David Mortensen, and with the able help of Cecil Steward, this course was based on local examples and used the new book *Under the Blade: the Conversion of Agricultural Landscapes*, edited by Richard Olson and Thomas Lyson. The course has been taught each spring since that time, and a syllabus of materials has been produced twice from the presentations and readings used in the course (*Urbanization of Rural Landscapes: A Syllabus of Teaching Materials from a University Course*. 1999. Edited by Richard Olson; *Urbanization of Rural Landscapes II: Second Syllabus and Teaching Materials from a University Course, Spring 2000*. Edited by Charles Francis and David Mortensen). Assembling

some references and a number of learning activities in the Green Book series provides a ready reference for others interested in teaching such a course.

In 2003 we modified the course to pursue a more active learning approach, and to stimulate students and faculty to contribute innovative ideas for impacting the local community. One motivation for this step was the realization gained in Nordic courses in Agroecology and Ecological Agriculture that *often there is a larger gap between knowledge and action than between ignorance and knowledge*. With this in mind, we designed a course that was built on the talents of the enrolled students in the spring semester, and combined these with the presentations of experts and activities and discussions in class. As course instructors, we are pleased with the emergent properties that were obvious in the course this year.

This book includes a number of letters to the editor, reflecting opinions of students on issues raised in the class and of particular importance to each person. This was a graded exercise, and students were encouraged to send the letters to a newspaper or newsletter of their choice. To our knowledge, four of the letters included here were published in newspapers in Nebraska. We see this activity as an important step for students to take their knowledge from the classroom and apply the concepts to real world situations and challenges.

Next we present a series of book reviews written by students after reading contemporary literature that was made available by the instructors. Several students mentioned that this was an important activity, bringing them closer to the current literature and in many cases opening their eyes to situations and future alternatives that were completely new to them. Oral reports on each book were presented, followed by brief discussion by everyone in class. These are the written reports. Although encouraged to submit these reviews to journals for publication, we are quite sure that none of the student reviews have been submitted.

Finally, the semester projects by each student addressed a series of issues related to land loss and conversion to non-farming activities. Each member of the class was asked to choose a topic of personal interest, and to explore the issues through literature review, surveys, interviews, or other methods appropriate to the question at hand. The final reports from these projects are included in the last section.

We think that this collection of student projects – letter to the editor, book review, semester project – provides an overview of the results of active learning. Based on the results of the 2003 class, we will modify and clarify the assignments. It is obvious that topics of great personal interest to the student engender a serious engagement with the issues. More research is done, and the activity results in a more relevant and interesting letter, review, or paper than if topics

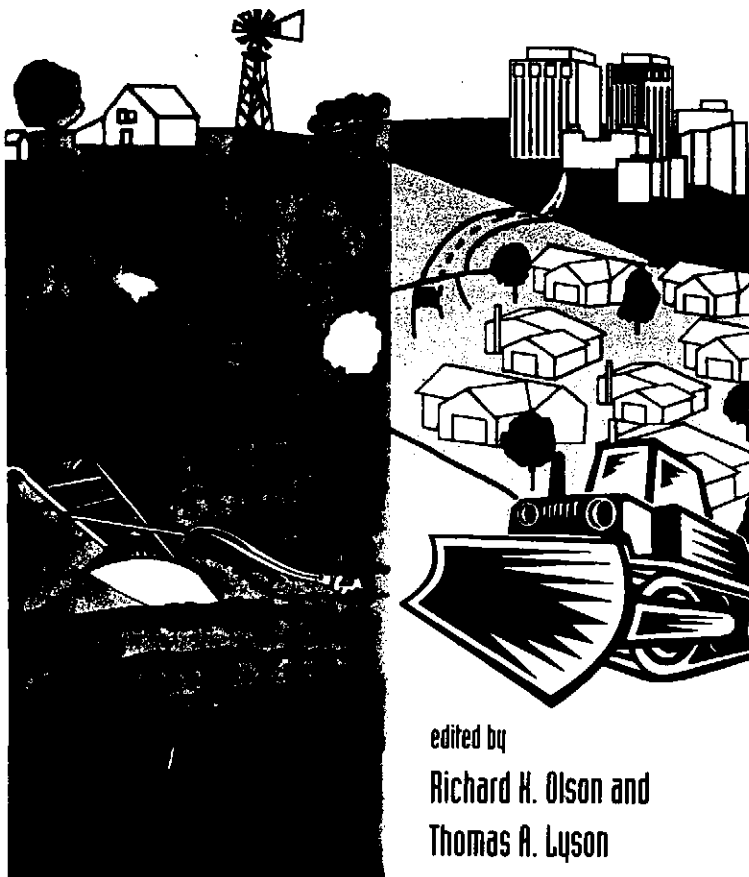
were assigned. Some of the letters were published, and we would hope to encourage a higher level of submission next year. We will strive to continue to provide new books, and hopefully some of the reviews can be published in the future. In term projects, some were more relevant than others to the topic of urbanization. It is important to clarify the assignment so that all papers will contribute to learning in this arena. The incentive of having three semi-formal publications resulting for each student in the class appeared to be a compelling challenge for some, while others were less enthusiastic about the exercise and potential for recognition.

In summary, we found this active learning approach to be a valuable one that induced a high level of enthusiasm and participation from most students. We intend to continue in this direction with practical products a part of what comes out of the course.

Mindi Schneider, Charles Francis, Dick Esseks, Editors

Under the Blade

The Conversion of Agricultural Landscapes



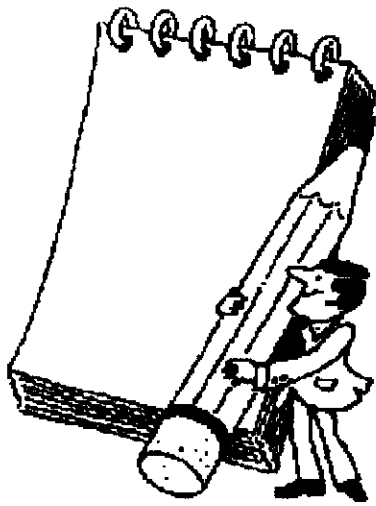
Text used for the course:

Under the Blade: The Conversion of
Agricultural Landscapes

Edited by
Richard K. Olson and
Thomas A. Lyson

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5500 Central Avenue, Boulder Colorado
80301-2877

Current list price at Amazon.com
\$44.00 paperback



Education and Activism:

Letters to the Editor

The very broad topic of the course, *Urbanization of Rural Landscapes*, can evoke powerful emotions. A myriad of perspectives and opinions about the issues surrounding urbanization provide opportunities for rich discussion. Those students and members of the community with a farming or rural background have different feelings about farmland conversion than those raised in an urban or suburban area. Likewise, the topic perpetuates debate between economists and environmentalists about appropriate behavior and action concerning natural communities. Conflicts such as these can be seen as a challenge for both “sides” to engage in dialog, and try to understand the motivations and values underlying each argument.

In an effort to capitalize on individual feelings, experiences, and prior interest, we asked class participants to compose a **Letter to the Editor** as the first graded assignment. In this way, students were given the opportunity to present their positions on any of a number of issues related to land use. Topics included in these letters range from food production to impact fees to models for smarter urban growth. Some letters are very passionate, while others take the voice of cool reason. All of the letters represent a form of community participation and activism. Four of the letters have been submitted and published in various media outlets in Nebraska.

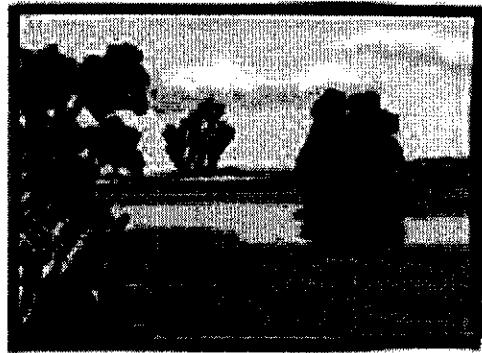
We view this assignment as a bridge to lifelong learning and involvement in questions of relevance to each student and participant from the community. In the U.S. there is a high level of apathy in the political process, as indicated by the incredibly low participation in local and even national elections. Too often students see their academic studies as disconnected from the real world and its immediate challenges. The assignment to write a letter to the editor as a graded exercise provides the stimulus for involvement. Especially those who submit their letters and see them in print will experience a feeling of participation that will perhaps be new and exhilarating to them. It is our intent that in the future everyone will submit their letters to be published, and that one of our goals of active learning, participatory education, and involvement will be furthered by this assignment.

Wetland Conservation

Wetland conversion on most farmland has been virtually halted by the EPA, NRCS, and the Corps of Engineers. City planners and developers, for some reason, apparently felt that the wetlands restrictions should not apply to the planned development of the saline wetlands on North 27th Street. This was probably due to a belief that large amounts of money would allow them to ignore or bypass wetland conversion restrictions.

Preferential treatment is not an option in this case. There is no question that the planned development would destroy a rare wetlands area. Saline wetlands are found nowhere else in the contiguous 48 states except for coastal regions. The saline wetlands cannot be replaced or mitigated if they are lost. The wetland, if allowed to remain, can provide a buffer between development and surface and subsurface water supplies. A cleaner watershed would be the result. In the interest of fairness and following the intent of wetland preservation laws, developers should not be allowed to further encroach upon the remaining wetlands on North 27th Street.

John Albert



Losing Land and GMOs

Over the past decade I have seen yields on our family farm steadily increase from year to year. I'd like to believe it's all due to superior farm management, but part of that management comes with the ability to choose what we think is best for our operation. Our operation hasn't changed all that dramatically over the past decade, so little that about the only thing to change is the acres of what we grow and what we grow on those acres.

We operate roughly a thousand acres in a 50/50 corn/soybean rotation. Approximately 95% of the corn seed is genetically modified BT hybrid. With the release of Round-up ready soybeans we have converted to all acres of soybeans being planted to these varieties. Major influences in these decisions have been economic as well as environmental and cost associated with implementation of these varieties.

What I don't understand is this.

Although not an immediate concern for our operation, urban sprawl has become a major threat to the rural farmers. With prime farmland being swallowed up by the millions of acres each year there is less and less land available to produce the products demanded each year. Without the implementation of certain genetically modified breeds the food industry would eventually be in a massive shortage.

Varieties once destroyed by disease and untimely weather patterns are now able to produce the yields once thought impossible not so long ago. Add in the fact that population will eventually outgrow production and the millions of acres lost every year to urban sprawl. How do the people figure on supplying enough food?

Consumers demand cleaner, healthier foods be available, but what they don't realize is

the cost associated with those demands. For the rest of the world, we understand these costs and the importance of genetically modified foods. We understand that with loss of productive ground certain steps will be made to insure adequate food for the world's population. If the consumers want the cleaner, healthier food, that's fine. They have created another market to help the economy in our time of need. I just hope they don't speak out so much as to ruin the economy that has brought us to this point. We need genetically modified crops.

Kyle P. Bell



Suburban Considerations

I have lived in Lincoln now for about a half a decade. With my job I am often on the outskirts of town. I have noticed an incredible amount of change in the city size in these last few years. Seeing change has made me realize that urban sprawl could be a large problem in Lincoln.

Urban sprawl happens when a city is growing so much in outward directions that farmers and small nearby communities are either being forced to give up their land or become part of the city. To some, this may not seem like a big deal but it has huge consequences.

Farmers are selling land because of property damage, safety issues with higher traffic, and problems with neighbors. Many new neighbors complain to farmers for having equipment on the roads while moving to different fields, dust problems, and noise. With the loss of farmers in the local area markets have to buy elsewhere increasing costs of goods. These are just a small part of the problems, among many others for residents in the city.

Expansion causes many different challenges. Have you ever thought how long it could take emergency services to reach your home if you live in one of the new developments outside the city? It may not be soon enough to save a life or a house on fire. So new stations closer to the edge of town are being built and more emergency personnel are being hired, all with taxes everyone is paying. Another concern is schools and the safety of students getting there. Many schools have to stretch the bus routes to pickup students from the edges of the city. Another option is building new schools on the edge of town, and this is expensive. So as you can see, urban sprawl can be a costly problem not only to the people building on the edges but also to you as a citizen in Lincoln. Please

take this into consideration and think about other options before moving to the suburbs.

Josh Bowers



Life and Death in Rural Nebraska

If I look back over the last 24 years that I have been a citizen of a rural Nebraska community, it is frustrating to accept the changes. The early 20th century Main Street brick buildings are slowly turning vacant. Houses once filled with families are sitting empty. Young families are opting for suburban communities. Are the days of thriving small communities over?

Twenty years ago, a small village of 600 residents had nearly 90% of all services and goods available. I can't remember how many times I visited the doctor on Saturday morning, was diagnosed with a cold, and then told to walk to the pharmacy to pick up my prescription. Needless to say, the pharmacy was within walking distance on the same side of Main Street.

Today I can't receive medical services in town. Nor can I fill my prescription, get my flat tire fixed, or even buy a flower for my mother on her birthday. The flower shop went out of business this week.

Reflecting this trend is the housing market in small towns all across Nebraska and rural America. How often do you drive through a small town and see real estate signs in the front yards of many houses? Will those dwellings ever be lived in again? Will they remain empty structures, or will they be purchased by young eager traditional American families looking for safe communities that foster the growth and well being of their children? The future does not look bright.

I don't have to travel far to see a world different than where I was raised. This is where Wal-Mart rules and suburbanites flourish in their homes. Entire cities surrounded by bulldozers are not more than a half hour away. Yet my hometown begs for these people and the services they could contribute to our community. Why does this continue to happen?

My proposal is to utilize the resources that are already in place. These buildings have character, history, and need to be used. Let's support the local grocery store, lumberyard, and service station.

I can't be too critical, however. We have some new businesses in town. In the old insurance building is now the Cass County Office on Aging. Just next door, in the old pharmacy, a second funeral home has started business. How appropriate.

In reality, I guess I can understand why this is happening. There are compelling short-term economic and social factors: jobs, entertainment, shopping. You can't blame individuals who want convenience, lower prices, and a movie theater. I have no problem paying a few extra pennies for a can of green beans or renting a movie at the convenience store. It's actually much cheaper than driving. I still enjoy home. I think I always will.

Joel Clements



Who Controls Our Rural Destiny?

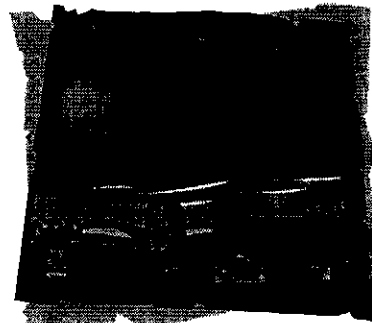
In the last fifty years, we have witnessed a dramatic transformation in land use, larger than all previous history. More farms, forest, natural areas and open space have been lost to urban development. Older communities and cities have lost any spatial constraints they once might have had, due in large part to improving infrastructure and technology. As a result, mass suburban sprawl has become more convenient and possible than in the past. Although not everyone agrees this transformation of landscape is negative, one thing is certain: the limited supply of land means less nature, less farmland, and less rural stillness for us all. With their natural beauty and high quality of life, rural counties have become a magnet for a growing number of Americans. Farmland is converted to subdivisions and malls with large parking lots. Topsoil of the agricultural landscape is being covered by asphalt at an accelerating rate.

Currently there are two routes that land development follows: expansion into current urban areas, and large-lot development (greater than 1 acre per house) in rural areas. Although some crops are particularly vulnerable to development, a threat to the overall national food and fiber production is not present at this time. However, there is concern with controlling and developmental planning before urban sprawl does affect food production.

So who should manage planning? This should lie in the domains of state and local governments. At the present time, it is usually too late to effectively control development by the time local governments begin to plan and manage growth. This needs to change, and the Federal Government may be able to help in some ways by coordinating local, regional, and state efforts. There may be need for providing government financial incentives for channeling growth in more desirable directions. It may not be easy or

cost effective immediately, but if resources could be redirected, most of the cropland with the greatest development potential could be protected, and kept in production.

Nick Emanuel



When in Rome ... Learn from Their Lessons

Indianapolis is a state capital where history abounds in monuments among the glass and steel structures of a modern economy. There last fall I found clues to where our society has been, and insight into alternatives for our future food system.

Jogging one evening I discovered the Scottish Rite temple, Masonic Hall, and a three-block march of war memorials -- fitting tribute to values of the founders and those who died to preserve this country. The elegant capitol was connected to functional state office buildings. Canal Walk was a new upscale neighborhood where slums once stood, near to the downtown gleam of glass and steel. Traditional values were reflected everywhere here in our food-producing heartland.

Next morning I retraced the route in pre-dawn darkness, and the impressions were completely different. That morning I was transported to ancient Rome. The Scottish Rite and Masonic temples became symbols of the institutional church, whose supreme influence and conquests replaced indigenous faiths. Still today His servants often eke out a subsistence living in the shadows of monuments. The church provided few answers for sustained food production.

The lovely capitol linked to the cold, square architecture of state office buildings reflected the drab concrete structures of the E.U.R. (Esposizione Universale di Roma) constructed by Benito Mussolini to demonstrate the power of government and Rome. These commemorated the rise of nation-states and their dominance until the end of World War II. Early Roman civilization with highly centralized control used up its own topsoil, extended its supply lines, and eventually collapsed due to lack of control and infrastructure.

Glass and steel suddenly became symbols of the marketplace and today's multinational corporations that dominate the world scene. Tucked in among the tall monuments were parking garages for chariots of people who worked in nearby offices or stayed in high-priced hotels where most employees (read slaves) could never afford to sleep or eat. Their dominance represented the current global financial and food system, one that accelerates the gap between rich and poor, and does not improve the food supply available to many.

Completing this snapshot was a three-block park with war memorials to commemorate the era of the nation state and its many armed conflicts. Close by was a modern day version of the Coliseum (the football dome) where Lions versus Colts can be found on any given Sunday. Nowhere was there a monument to peace, nor to people producing food or protecting natural resources.

What do these metaphors have to do with agriculture and food?

The nation-state's power has grown and ebbed, though national borders and flags maintain current autonomy. Governments have developed valuable infrastructure and economies, transforming many agrarian-based societies into urban-centered cultures. People are better fed today than ever, yet they are isolated from natural areas and sources of their food.

Exclusive multinational corporations today transcend geography. They owe allegiance to stockholders. Companies operate in a global sphere that provides raw materials and foods from everywhere and ready markets in rich countries. The majority of people worldwide do not benefit, though they contribute natural resources and often labor to keep the machine going.

Military power assures long and open supply lines, so that nation states and corporations

can pursue their agendas. The U.S. has a military policy to control rogue states and against terrorism. But we have no consistent national policy to protect natural resources, nor assure a long-term food supply nor equity of access to this basic human right. We refuse to sign most international treaties in this arena.

My early-morning jog revealed symptoms of a society, like Rome, that has not come to grips with long-term challenges of supporting people and their basic needs. We need a new ecologically-based strategy, looking to nature for guidance in designing an economy and food system. For example, can we morally continue to generate five times more carbon dioxide than vegetation in the U.S. can recapture into the terrestrial ecosystem? Can we sustain a society with growing inequities in wealth and access to food and other basic necessities?

It is time to re-evaluate national and personal priorities, to recognize connections with the natural world, and to preserve soils and other resources for the long-term future. The church, the nation-state, and the multinationals have all operated in the exploitive or mining mode, accumulating resources with little regard to long-term stewardship.

A future ideal city could be linked closely to the land, and nearby farms could meet most food needs. Monuments could celebrate peace and our interconnections with the soil and natural ecosystems. Governments could serve people. Private corporations and cooperatives could be local rather than international. The early morning splendors of Rome could be decentralized and organized into hundreds of viable and sustainable communities.

We owe this to future generations, starting with the Iroquois philosophy of considering the impacts of our decisions for seven generations into the future. We do not want to become ancient Rome.

Charles Francis is professor of Agronomy and Horticulture, University of Nebraska, and a member of the Prairie Writers' Circle and the board of directors of the Land Institute, a natural systems agriculture research organization in Salina, Kan. The opinions expressed are his own.



How to Save our Rural Landscapes

Rural land, essential to America's future, is under attack. Urban sprawl, at its current growth rate, will reduce available U.S. farmland per person by more than 50 percent over the next two generations, **according to the book "Under the Blade" by Richard Olson and Tom Lyson.** And most of our farmland itself is managed in a way that also destroys our rural landscape.

There are alternatives. Their success and that of this country require looking at land as more than something to be consumed by human exploitation.

Landscapes are more than broad-scale paintings of places serene. Beneath their veneer of grass and trees lie worlds where one teaspoon of soil may contain a billion organisms. These connect with the plants and animals above as vital ecosystems developed over millennia to fit particular places. The complexity is such that we have yet to identify most of our neighbor creatures.

Farm fields dedicated to monoculture wheat or soybeans scarcely resemble the original prairie or woodland tapestries. We homogenize and, with synthetic chemicals, try to dominate nature's work.

Our food is cheap and our food system is highly productive only if measured by labor and land. One major cost, not on the supermarket receipt, is the unsustainable subsidy of petroleum energy for fuel and fertilizer. Another, not apparent when viewed from the interstate, is the loss of myriad "ecosystem services."

The natural land, with its continuous and relatively complete ground cover, slows runoff and absorbs it in soil often containing at least 4 percent organic matter -- far more than most crop ground. The process removes contaminants. Wetlands further clean the water, and store it. Continuous living plant

roots secure soil and its other organisms for thorough recycling of nutrients in this thin mantle on which almost all land life depends. Plants in the landscape slow the wind, and clean the air of dust and other particulates. And natural land is the treasure of biological diversity that has provided all of our domestic crops and animals.

Modern agriculture drastically simplifies the land and reduces the working of ecosystems. Annual crops and scorched-earth weed control leave the soil bare for much of the year, inviting erosion. Continuous cultivation speeds the loss of nitrogen and organic nutrients that plants need. Crops take up less than half of the fertilizer nutrients applied to them. Soluble nitrate leaches below the roots to contaminate ground water. Erosion carries nutrients into waterways, causing major ecosystem changes such as the 8,000-square-mile "dead zone" where the Mississippi River dumps into the Gulf of Mexico.

A less obvious dead zone is in the Midwest. Industrialization's consolidation of farms creates ghost towns where we once had thriving rural culture. When **farmers** buy tractors from another state or seed from a multinational conglomerate, little goes to the local economy. When their commodities are sold by the trainload through distant buyers, little comes back. No wonder many farm families today don't encourage their children to stay in agriculture.

Trends point to further consolidation of agriculture, but there are exciting alternatives. Enlightened consumers are turning to farmers markets, directly buying from farms and contracting to have vegetables grown. These sales are essentially all from small farms, where farmers know their land better and try harder to conserve soil and water, contributing to diversity and a more intact agroecosystem.

Grazing beef, dairy, sheep, swine and poultry with only supplemental grain makes

leaner and more healthful meat. Grass-fed beef is higher than the feedlot variety in omega-3 fatty acids, essential nutrients that are in short supply in the average American diet. Increased demand for animals raised under more natural conditions would favor the environmentally conscious small farmer.

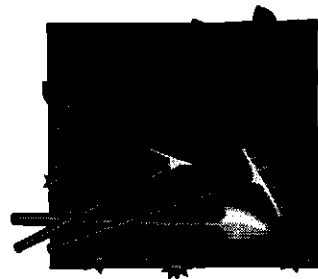
The business of organic foods has for over a decade enjoyed annual sales increases of more than 20 percent. Organic produce is becoming such a hot item that several large organic food processors have been purchased by multinational food giants. The industrialization of organic foods prompts many consumers to ask whether it is better to buy locally rather than from producers a thousand miles away.

Although the new farm bill continues a disproportionate support for industrial farming, it also broadens incentives for conservation and agricultural diversity. Innovative research at a number of land-grant universities and other organizations seeks an agriculture that mimics nature to reduce ecological destruction. One possibility being explored: Replacing annual grain crops with perennial varieties in mixed-plant communities, which would reduce the need for supplemental fertilizers, artificial pest control and soil cultivation.

We should support such creative alternatives in the face of the present assault on our rural landscapes and remember the words of Nobel laureate Rene du Bos: "Trend is not destiny."

Charles Francis is a professor of agronomy at the University of Nebraska-Lincoln and a member of the board of directors of the Land Institute, a natural systems agriculture research organization in Salina, Kan.

Released for publication by the Prairie Writers' Circle, an activity of The Land Institute, Salina, Kansas.



Can Europe's Model Help Us Protect Agricultural Lands?

In the U.S. Midwest we live in wide-open spaces. Most prairie has given way to fields of corn, wheat, and soybeans, and the rangeland to improved pastures. But we still seem to have plenty of space. Visitors from Europe are heard to proclaim, "What a huge and empty country this is!"

Europeans have learned over centuries to protect farm lands. What these visitors don't see easily is the accelerating conversion of our open farm and range land to development. They also don't see the prohibitive land prices that make it next to impossible for new farmers to get started. Across the country, we currently convert land to small acreages, housing developments, malls, roads and industrial uses at a rate unprecedented in our history. American Farmland Trust reports that close to 3 acres are converted to non-agricultural uses in the U.S. every minute! The average area of land per person that is changed to non-farm activities over the past two decades is at least 50% higher than the average used by people before 1980. Even the rate of loss of farmland is increasing across the U.S.

Tammy Zimmerman and her family raise swine, corn, and soybeans near Beatrice, Nebraska. On World Food Day, she said that the last four farms sold near her place were for a golf course, a hunting farm, a subdivision, and a new power plant. Farming can't compete with prices paid for those land uses.

During the recent year-long planning exercise by Lincoln and Lancaster County, many groups with vested interests held meetings and planned strategies to further their agendas. Home builders and environmental groups were especially active and well represented in hearings on the proposed master plan. One of the least organized groups was farmers. Most who testified were concerned about the impacts of new zoning on their

gains from future land sales – not how to preserve farmland.

We learned that part of their disincentive to continue farming is the incredible increase in land values due to speculation for development. In fact, there is no part of the county where land values are based on their potential for agriculture. All are impacted by future development potential. David Goeller, University of Nebraska Farm Transition Specialist, says that land prices are up because of low interest rates, poor stock market, new federal farm programs, and tax advantages for property transfers.

Are there any viable alternatives? When we were on sabbatical leave in Norway in 1998 we observed a different approach. Our cousins in northern Europe have found ways to solve or at least minimize this problem of sprawl. The establishment of permanent green belts around cities is an accepted way to designate land beyond the border as farmland forever. For example, the forage production field behind our house in the village of Ås, Norway was designated for agriculture, now and always. When I asked when that area would be developed, given shortages of housing near the university in a town of 8,000 people, the question was met with a blank stare. "But that's farmland, of course. It will always be that way."

In Norway and Sweden all people have access to private forest land, even without permission, as long as they do not take or leave anything – this is based on common law going back more than 1000 years. The entire coastline in Norway is public domain. I have found that there is much to learn from other systems and cultures.

One way to explore other alternatives to current U.S. sprawl is through education. Each spring we offer a course, *Urbanization of Rural Landscapes*, that is taught in the evenings to make it accessible to people in the community as well as to students. We study

the statistics of sprawl, and examine places in California and Pennsylvania where the challenges is even larger than our own in Nebraska. Our students explore the long-term impacts of unchecked urban growth, and seek alternatives based on models from innovative communities across the U.S. and elsewhere. Prairie Crossing, a cluster-driven new housing development in Gray's Lake, Illinois is one such model that preserves both prairie and farmland around the houses.

Through these examples and initiatives, we help people become more aware of the impacts of our individual and community investments and decisions. The loss of land could be called the result of a "tyranny of many small decisions" from which a few people profit, and after which public open space as well as farmland disappears. We hope education will make a difference, and we can look to Europe for solutions they have developed over centuries of experience.

Charles Francis is Professor of Agronomy and Horticulture, University of Nebraska – Lincoln.

Released for publication by the Prairie Writers' Circle, an activity of The Land Institute, Salina, Kansas, October 16, 2002



Rural Residents and Impact Fees

The recent debate and approval of impact fees in Lincoln has been an interesting study of government and the private business sector. Those of us who live in rural Lancaster County should pay close attention to the happenings with our city cousins. The cost of new development has to be paid by someone, whether through impact fees, bond issues, taxes, or other means. Growth in a city such as Lincoln has a financial impact on the community. Does it have a financial impact on rural residents?

We know development turns prime farmland from agriculture to urban uses. The costs of this development just in the loss of farm ground ripples through the county and surrounding areas. What are other costs to rural residents?

If the home builders and developers are correct in their assumptions that impact fees will slow growth in Lincoln and growth is needed, where will it grow? Will development continue to occur in rural Lancaster County, away from the city's regulations, only at a faster rate?

Rural growth has costs as well: rural water districts, roads and road maintenance, mail delivery, electrical utilities, and most important by schools. The costs of growth in outlying school districts have been a concern for all of the county's School Boards. Amongst all of the studies that have been done in the city of Lincoln, have there been any on the fiscal impact on the County?

Rural residents cannot sit idly by while our city cousins debate this topic. We need to be involved in the discussion and be heard. Concerned input by rural Lancaster County residents must not end with the comprehensive plan.

Dean Lesoing

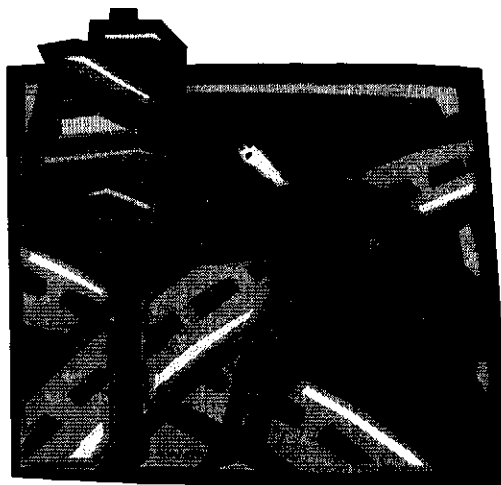


Our Limited Land

In my years in Lincoln, I have seen residential developments stretch farther and farther into the countryside with the growing population. This is likely to continue as long as Lincoln's population continues to grow. This is not a problem unique to Lincoln, but it is extremely important that the people responsible for the expansion of our city understand the impacts that large lot residential developments will have on the land and the community as a whole.

In a place like Nebraska, it is easy to forget that the land that we have is limited. It is important that developers try to keep this in mind as they convert agricultural land into residential developments. There are alternatives to the currently popular developments consisting of large parcels of land with few homes. We would be able to slow down the rate of urban sprawl if developers were to consider cluster type developments with many homes on small lots within a relatively large development. These residents could still be close to nature as there could be a commons, but they would benefit from the conveniences of a community such as paved roads and proximity to neighbors. This is only one of many ways that we can more efficiently house our growing population. I think that Lincoln and the surrounding areas could benefit from developers and homeowners opening their minds to such ideas as they could help to slow the spread of the city and to preserve our rural areas and farmland.

Thank You,
Andee McGinn



Let's Revitalize Lincoln

In the past few years since moving here, I have had the opportunity to drive around Lincoln and see different parts of the city and surrounding countryside. The amount of growth is amazing and bespeaks of a healthy economy in the area. I have also noticed the richness of the community and the pride taken in the city of Lincoln by its residents. The Haymarket is a prime example. For this reason I am surprised at the amount of development that is spreading into the rich farmland of eastern Nebraska.

I would like to see contractors and developers spend more money and time on revitalizing more of the interior of Lincoln. There are enough areas that are rundown and in need of remodeling projects. It would only seem to be in the best interest of Lincoln to redevelop some of these areas. Would it really cost that much more? Maybe less? I think the pride of Lincoln that is so strong here can help to keep the heart of this great city alive.

Greg Miller



Land Use Dilemma -A Request to Citizens

Urban sprawl is destroying the American city and its social fabric along with one of our major resources, farmland.

The land use planning system in our country since World War II has systematically destroyed millions of acres of prime agricultural land. The dominant theme of our American culture is that more is better. We have been brainwashed by television (the second leading destroyer of the American culture) into thinking that we must have an excess of everything, including land, to be happy. While this may be true to many, there is a growing contingency of people who feel otherwise.

The change they are demanding is Smart Growth. The principles guiding this land use planning method were used throughout our country before World War II. Most countries still adhere to this practice.

Smart Growth promotes the use of density to achieve several goals which include: an identifiable center and edge, walkable streets, a mix of land-uses & building types, an integrated network of walkable streets, and special sites for civic uses.

These principles help to create sustainable neighborhoods, decrease the dependence on automobiles, promote social interaction, create a sense of place, and most importantly, preserve farmland. For examples of Smart Growth, visit nearly any small town across America. It's no wonder people find them excellent places to raise families!

Why do people travel to the Haymarket in Lincoln, the Country Club Plaza in Kansas City, or historic Charleston, South Carolina? They create a sense of place, a destination, and a feeling that cannot be mimicked by our current development pattern.

City building practices today are not sustainable. The development community of Lincoln continuously builds residential sub-

divisions and commercial centers that are unsustainable, require the use of a car, promote isolation and income segregation, don't create a sense of place, and devour prime agricultural land.

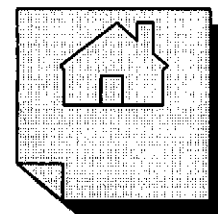
Lincoln and Lancaster County are under attack. By continually allowing urban sprawl to occur at our fringe and beyond, we destroy the non-renewable resource that will be this country's downfall.

This development pattern will not change unless the market changes. We the citizens are the market and must demand the change. Until this occurs, new sprawl developments will occur and we'll buy them due to a lack of choice.

My appeal is to the citizens of this city and outlying areas. Make a stand and reject the current sprawl we are forced to live in. Demand a change, then we'll have a choice to live in a sustainable neighborhood that does not degrade farmland at near the current rate.

I'm not a "tree-hugger" or an anti-growth advocate. To the contrary, I am a supporter of development and growth. Construction is necessary to sustain a healthy local economy. In addition, the growth rate the city of Lincoln is experiencing dictates the need for more housing and jobs. I would argue, however, that we can design cities smarter and better than they are now. Developers and homebuilders in other cities are actually making more money within Smart Growth communities! What's the hold-up in our region? It's us, the conservative citizens of the American Midwest who buy what we're used to seeing. We must discover the wonderful advantages of Smart Growth. Until that time, we will be stuck with the bland subdivisions and strip malls that obliterate farming in our county.

Jered Morris



Acreage Development and Impact Fees

I am writing to both applaud the recent passage of impact fees by the Lincoln City Council on January 13, 2003 and to encourage thought about the rural development taking place in the county. In the comprehensive plan, last updated May 2002, rural acreages were excluded from Phase I, except where already zoned or previously designated for acreages or under development. In these areas, current planning varies the allowed housing density to be between 3 and 14 homes per acre. Thanks to the passage of the new impact fees \$2500 to \$4500 per unit will be collected to develop the necessary infrastructure.

In the areas outside of Phase I, rural acreage development will continue. These areas outside of the City of Lincoln's Phase I planning area are either zoned Agriculture Residential, with the possibility of low-density development of 200 homes per square mile, or Agriculture with new acreages requiring 20 acres. The purpose of concentrating small acreages is to facilitate future annexation. The close proximity would also enable the establishment of rural water supplies and sanitary sewers. This would make the annexation process easier. A current study will look at creating impact fees for rural acreages.

I feel impact fees should be imposed for rural acreages for three basic reasons. The first reason is to offset the artificially low cost of rural lands. The current lot price for rural lots does not include the cost for infrastructure supplied by the County. These costs include the cost for storm water management along rural roads, the maintenance of roads, the cost of education for rural families, and emergency services. If the possibility of future build-through created by annexation are added, the cost of sanitary sewer, water supply and road paving can also be added.

A current study by the American Farmland Trust identifies farmland of high, medium and low values in Nebraska. The entirety of Lancaster County was identified as consisting of high value farmland. Why then is any of the area outside of immediate growth being considered for Residential Farmland? The Lincoln Lancaster County Comprehensive Plan dictates that enough rural lots will be available to accommodate 6% of the Counties total population. As the City of Lincoln grows, the amount of land available for acreages will grow also. Why not make them pay their fair share, and at the same time remove any false economic incentives to moving to rural acreages?

Jim Newman



Morehead's Marina vs. The Mighty Mo'

In regards to the article in the January 16, 2003 edition, "Riverfront project edges closer" I have to speak out. Last year this paper published an article, that highlighted the Riverfront "Park" project, one that would allow for Morehead's Marina. As I remember Mr. Morehead had wished to create a major subdivision in this area, but the city did not approve. Instead what was approved is the "Riverfront Park" and Morehead's Marina. Now we have Morehead Island, which I quote your paper is "part of the river front development project." This will include 160 boat slips, a restaurant/event center, a mix of 26 cottages and cabins, 15 R.V. pads and 10 commercial lots.

I would like to know what the city planners consider is the difference between a major housing development's impact and this major commercial development? I want to know why the city believes the Missouri River will never flood this area? I want to understand how the Corps of Engineers could issue a permit for such development along the most endangered river in the United States. As the Corps has to accept a good bit of the responsibility for the present state of the Missouri, I would think the Corps would be trying a little harder to right it's wrongs. I want this community to remember the fact that the Missouri River use to run where the railroad tracks are now. I look at how the Mississippi River keeps outsmarting the Army Corps of Engineers and I have to wonder....just how does the Missouri River flow and how wide can she grow?

How can we adapt to the reality of this marvelous natural resource, and think less about dominating the area strictly for personal gain and short-term returns? The Missouri River is a main reason Plattsmouth is here as a community today, and as members of this community we have a vested interest in maintaining the health of this river.

Linn Norton
Plattsmouth, NE

**Published in the Plattsmouth Journal,
February 21, 2003**



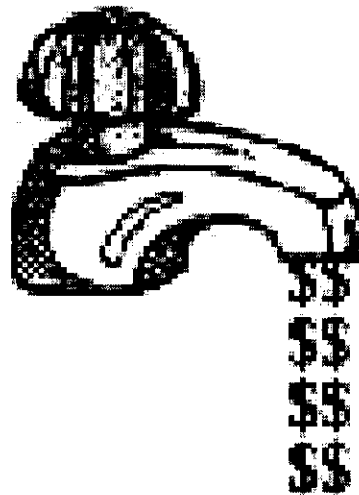
Drought Activism

With the coming of spring, and no real precipitation in sight, one might ask what he or she could do to help alleviate the impending drought crisis. Each Lincolnite has the opportunity to do *something*. Warm season grasses, such as buffalo grass offer a native plant option to prevent the overuse of water on summer lawns. Kentucky bluegrass, a non-native species, consumes ninety percent of Lincoln's summer water. This compounds the current economic and urbanization problems facing farmers, depriving water use for more important applications, including environmental preservation and food production.

What sense does it make to water a non-native grass that isn't drought resistant? Water bills and budgets would fall dramatically, increasing water supply for wildlife and agricultural production. The retention of the current supply of the Ogallala aquifer is essential to the preservation of our heritage, our economy, and our fellow farming citizens. By preserving now through the planting of warm season, drought resistant grasses, we can ensure water sources for what really matters. Kentucky bluegrass uses 90% of our water per summer! You can check out our summer usage on Lincoln's website, <http://interlinc.ci.lincoln.ne.us/city/pworks/water/pumpage.htm>. It is easy to compute the amount of water we would save in *millions of gallons per day*.

What can we Lincolnites do? Petition your neighborhood asking for names endorsing local legislation to end bluegrass lawns in new developments. This city can take giant steps by serving its constituency by using responsible and sustainable practices. This can also showcase Lincoln's aptitude for being a progressive city mindful of its impact on the future. Do your part—push for petitions!

Caleb Pollard



Consider the Land, Consider the Future

In the United States, cities are spreading like a cancer across the land. It seems that we believe our land to be both limitless and resilient. We turn landscapes that once supported a great diversity of plant and animal species into areas dominated by pavement, turfgrass, and the occasional juniper, barberry, yew, spirea. In the book *Under the Blade*, the authors state that the nation's most productive soils are also the most urbanized. Clearly, our society understands neither the importance nor the value of agriculture, or of the natural landscape for our long-term survival.

People are disconnected from the land on which they live and from the food that they consume. As a result of several interacting factors, industrial agriculture has become the overriding framework for our food system. As consumers, we usually have no clear conception of *where* our food was produced, much less *how* it was produced. In fact, the food that we eat has often been processed to such a degree that it may not even be recognizable as fruit of the Earth. Because of this disconnect in the food system, there is an accompanying disconnect between people and the land. We are not intimately familiar and aware of our absolute reliance on the Earth for our very existence. We pave over soils that ultimately sustain us without understanding the consequences.

Conversion of agricultural land does not just influence food production. The ecological functioning of the natural landscape is also compromised. Where soils once absorbed rain water, the impermeable surfaces created with each addition of pavement in the urban realm creates the potential for flooding and compromises the ability of the land to hold precious water. In times of drought, this gap in the hydrologic cycle becomes a very important problem. We further rely on natural landscapes for slowing the wind, thus reducing the impacts of strong storms; for photo-

synthesis and producing oxygen that we breathe; for the potentials in carbon sequestration that are vital in an era of global warming; and on and on.

We cannot live separately from the realities of the ecosystem. Humans are part of the ecosystem, and as such are subject to both the privileges and constraints of membership. It is true that the configuration of our brains has put us on a different level and gives us different skills than other species. This capacity gives us more responsibility in the preservation and maintenance of the ecosystem. It does not give us free reign for destruction. In fact, such activities ultimately compromise the life support system for humans, as well as other species. Species disappearance should be viewed as red flags that things are not quite functioning correctly. It is not so much a matter of "Saving the Salt Creek tiger beetle" (though that is a quite important study and effort), it is a matter of recognizing the breakdown in the system. Alert! Alert! Something is wrong!

We must begin to consider the land as something more than a commodity and "wide open space" waiting for development. The land is alive. The land is functioning. We must consider the future of land, where *all* future creatures will live and derive their existence. Concrete, by definition, is permanence. When we pave, we foreclose on potentials for the future.

Mindi Schneider

**Published in the Lincoln Journal Star,
April 5, 2003**



Is Altruism Dead? Land-use Decisions at the Local Level

Steven J. Gould eloquently discusses in his book *Ever Since Darwin* the concept of altruism and how it relates to our species passing on its genes to future generations. In essence, specific individuals within a species tend to make decisions that will ensure that their genes are "passed on" to future generations.

Land is widely accepted as one of our most valued resources. On the most basic level, productive, fertile agricultural land serves to provide our species with our most basic need, to survive, energy through food. The availability of quality food enables us to ultimately survive and pass our genes on to the next generation.

How does altruism relate to land-use decisions involving agricultural land? It relates to how land-use decisions are made at the local level through the private and family decisions and the change of zone application planning process. These comments focus on Lancaster County.

The argument is that land-use decisions on the local level are not altruistic in nature. This could have serious ramifications for future generations due to the ever increasing constriction of agricultural land. The need for implementing agricultural land conservation policies should be obvious.

While driving to work, I noticed a zoning action sign posted in a farm field. To most, this would go unnoticed. But a Community and Regional Planning student is stimulated to think about our local planning process as it relates altruism and the conversion of agricultural land through the change of zone application process.

The piece of farmland with a zoning action sign is prime for development. I speculate that the farmer must have gone through

some thought process to decide to sell and/or change the zoning of their property. More than likely, selling the land for development would yield more dollars per acre than farming. On the surface, this action would seem to be altruistic in nature if we assume that selling this land would provide for a financially stable future for children and/or grandchildren.

On the contrary, this action of selling the farmland for development is not altruistic in nature, but could be detrimental to future generations. Maybe 50 or 100 years in the future the availability of productive agricultural land will be an important issue. Therefore, how can we ensure that our future 5th, 6th, or 7th generations will have a sufficient supply of quality food? While the argument of altruism is abstract, I feel that outcomes of local land-use decisions underscore the need for our community to consider drafting and implementing agriculture land conservation policies.

The Lincoln-Lancaster County Planning Department's Greenprint Challenge is a step in the right direction. It recognizes that agricultural land is often sought for development and that encroaching urbanization increases the value and therefore the conversion rate of agricultural land.

The Comprehensive Plan also discusses agricultural lands. The vision briefly mentions that production farmlands are valuable assets. However, the Comp Plan does go further under Future Conditions - Community Form, Guiding Principles for the Rural Environment by recommending that a strategy be developed to preserve our natural resources, including land. But nowhere in the Comp Plan is the importance of conserving our agricultural lands discussed, nor the need for developing policy to address this issue.

With agricultural lands occupying about 77 percent of the county, now is the time to

start thinking about our distant future generations, the availability of prime farmland, and need for farmland conservation regulations. We owe our future children no less.

Chris Schroeder



Drought and Landscape Alteration

Urban sprawl, "dispersed, low-density development that is generally located at the fringe of an existing settlement and over large areas of previously rural areas." This is taking over our precious farmland at a rate that is hard to fathom. Farmers are giving in to high prices offered by greedy developers for choice farmland near bustling cities. One of the main reasons to sell is the money made from selling the farm ground is enough to retire and live happily. Many farmers do not realize the implications of this land being taken out of production and put into acreages, or small sub-divisions. One issue not being considered is the continued drought and failing economy that makes it harder for farmers to earn a profit on their land.

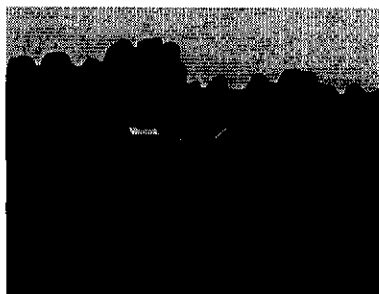
For several years the Midwest has been in a severe drought, with little relief in sight. Many farmers were having a difficult time making a decent living off of their cropland before the drought, and now with the drought profits have fallen even more. Some farmers have been hoping also. Many are finding the only way to stay afloat is getting a side job or selling off some of their most productive land to greedy land developers for a premium price. With this, the only way out of the progressing slump, many do not even take into consideration the implications of giving in and selling off their land.

Acreages are one of the most problematic developments types being started all over the United States today. They are the most illogical uses of land in this day of disappearing farmland. After the precious farmland is plowed up, it is used to hold behemoth houses, and large tracts of water hungry turf. Turf lawns utilize too many precious resources and add little to the betterment of the environment. Smaller sub-

divisions are not any better users of the land other than more people are living on the same sub-divided area. If land is taken out of production farming, a conservation program should be used to allow that land to be converted back to farmland if needed in the future.

So with the continued drought I only foresee more precious farmland being converted to acreages and sub-divisions because of farmers failing crops and lack of money. How could you resist an offer for your land that would make you more money that you could ever make in thirty more years of farming on that acre of ground? The government should subsidize farmers or give them incentives to keep the ground they have in farming until the drought has passed and farming is back to a more profitable occupation. Farmers should also look into the many other options like agroforestry systems and alternative horticultural crops to help create new products and subsidize their farming.

Joseph Smith



Farmland Conversion

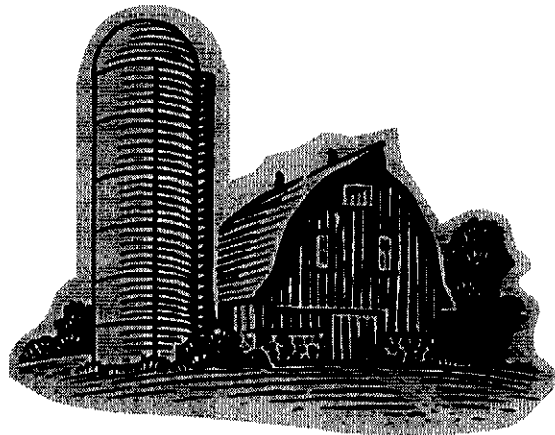
The conversion of American farmland is very serious and important issue that most Americans know little or nothing about. Converting farmland into homes and other urban uses is a public issue in every agricultural region experiencing rapid urbanization.

In the past, some cities grew much faster and used up less of our valuable agricultural land. People in the first half of the nineteenth century knew productive agricultural land was a very valuable resource and thus build vertically instead of horizontally. People's values have changed in this country. It is fashionable or trendy to move to the fringe of a city and live on a couple of acres of farmland and do not think twice about the costs, either to the environment or to society.

Often, and effect of these people moving is that it furthers the stratifications both in race and in income levels of our cities, because not everyone can afford to leave to the suburbs. The poor neighborhoods become poorer and the middle class neighborhoods in which the upward mobile people used to live are now being settled by lower income citizens and minorities. Abandoned neighborhoods will turn into ethnic, low-income enclaves.

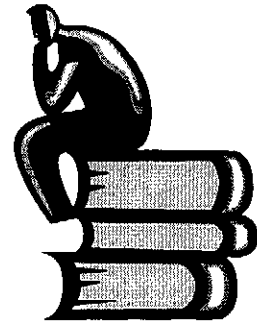
The issue of farmland conversion is one that is important. For cities and towns to grow, some farmland must be developed to accommodate change, but these developments do not need to be "super sized" like everything else in America. Our culture is such that we believe we are entitled to anything that money can buy. For American farmland to be saved, this way of thinking must be altered.

Steven Zimmer





Moving to a Larger Audience: Book Reviews



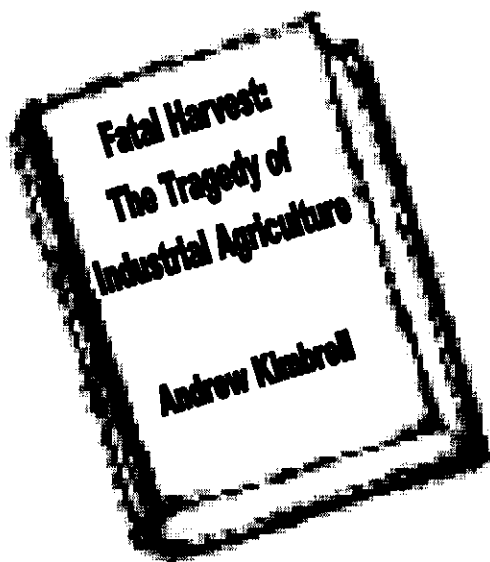
A relevant and exciting body of literature pertaining to *Urbanization of Rural Landscapes* is developing rapidly. Farmland loss, *Smart Growth*, environmental and ecological decline, and sustainable development are the focus of an increasing number of new publications. Because the rural-urban interface is in a constant state of change, it is important that students and community members are informed about the most recent information. While the idea of reading *all* of the useful contemporary books might be daunting to the individual, when this task is shared by a group of interested and concerned persons it becomes more attainable.

The second graded course assignment was a **Book Review** on a pertinent current topic. A wide selection of books representing contemporary thought on urbanization and farmland loss was provided. Each student and community participant was asked to select and read a book of their choice from this mini-library, or to choose another title with instructor approval. Students were asked to write professional and publishable reviews, and examples of previously published reviews were made available as references on form and content.

In order to foster the learning community, students presented short oral reviews of their books, followed by brief class discussion. By sharing, the entire community was informed about recent publications and the opinions of fellow classmates. In this way, the information from an array of sources was passed on to a wider reading audience. With this more informed idea of books available, people expressed great interest in several of the books read by others. The reviews are published here so that the bounds of the learning community are expanded to others interested in the urbanization phenomenon, and information about recent literature is further disseminated.

Many class participants commented on the value of the book review exercise. Again, we intended for students to submit these reviews for publication, though none chose to follow this path. In the future, we will advise students about possible outlets that are appropriate for their writing and more enthusiastically encourage this growth step as a component of the learning process.





***Fatal Harvest: The Tragedy of Industrial Agriculture*, Andrew Kimbrell (ed). Island Press, Washington D.C., 20009. 396 pages, hard \$75.00, paper \$45.00, 2002, ISBN 1-55963-941-5.**

Fatal Harvest: The Tragedy of Industrial Agriculture is a collection of essays and critiques of the way agriculture is conducted in the 21st century. Our current time is described as a "crisis", a fork in the road that will either lead to a future of ever increasing environmental degradation and monopoly of agriculture by big business, or the start of a movement to rediscover agriculture's agrarian roots. This movement may present an opportunity to practice truly sustainable farming practices and environmental responsibility.

In the prologue, Douglas Tompkins describes this book as an activist work. No matter which side of the issue the reader takes, he must agree that this is indeed an activist work. It calls for change in how nearly every aspect of today's agriculture is conducted, from tilling the land to the marketing of its crops. In so doing, it attempts to chart the past and current course of agriculture in this country and the increasingly

damaging way in which it is conducted. It predicts a future of dominance by a few large industrial businesses motivated by profit, driven to capture entire markets. The book predicts that this will lead to growing detachment from the land, which will then be treated as a disposable commodity rather than an irreplaceable resource.

The book is divided into parts, each of which examines the most important components of agriculture. Each part comprises a series of essays detailing how agriculture has become almost beyond control, heading toward a future that must be reversed if we are to have anything left for our children. Key concepts are defined which are seen as the cornerstones of revisionist agricultural thought. Industrialism, the term for our current way of conducting agriculture, is described as leading us down the wrong path, away from agricultural sustainability. Agrarianism, a way of thought based on the best local use and care of the land, is the centerpiece of revisionist thinking. Economic localization is another key concept central to making the agrarian ethic work. Simply stated, it means that society must use the local products of an agrarian society, importing whatever other goods and services are needed.

The book's best feature is in its ability to inform the average consumer about the realities of agricultural production and the extent of the economic, cultural and environmental problems that have resulted from our choices in farm policy. Hopefully, greater awareness will result in a grassroots effort to bring the desirable features of sustainable agriculture to reality while addressing the risks inherent to farming in the present century. This book would be improved if it gave a more detailed account of the way federal farm programs have brought about the current problems in agriculture. The original intent of farm programs was to reduce the financial risks associated with farming and guarantee adequate supplies of

essential crops. The unintended consequences of our farm program policies is what this book is about, yet specific solutions to farm program problems are not mentioned. Changing these programs to reward sustainable farming practices is the only way that beneficial change will come to pass.

I agree with the central premise of the book, which is that we must get back to our agrarian roots to develop the agricultural model for the 21st century. If some of the best features of the organic farming practices described in the book were integrated with a more sensible farm program that rewarded diversity and innovation, a more stable, environmentally friendly farming ethic would be the result.

Submitted by John Albert



Saving American Farmland: What Works, American Farmland Trust. American Farmland Trust, Herrick Mill, Northampton, MA 01060. 334 pages, paper \$34.95, 1997, LCCN 98-132214.

This book as an interesting and intriguing title, *Saving American Farmland: What Works*. I have watched my father's farm grow ever so slightly over the past decade and have become an integral factor in the operation. Over these past few years thousands of acres of farmland in our county have gone up for sale, and some of that land sold had been part of our operation for over forty years. During that time our operation has struggled to make ends meet. That is why I'm here, studying agricultural economics at UNL. In order to know how to save our farm, I want to learn what works. This book, published by the American Farmland Trust, has become an integral portion of my education.

The book begins with some basic statistics and factual information that really show how agriculture has been slowly and gradually pushed aside. Much of the statistical information came from the National Agricultural Lands Study (NALS) completed in 1981. NALS reported that as a nation, the US was losing roughly three mil-

lion acres a year; one million of those acres were of valuable cropland. However controversial the numbers, the real results were there and seldom disputed: "Very large areas of farmland were being permanently converted to nonagricultural use." (p. xi).

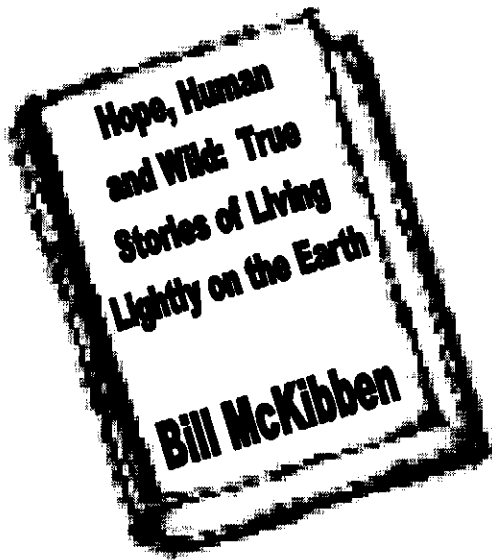
A question is posed in the introduction: why should we save the farmlands? Four main points describe in detail how to answer this question locally and globally: to ensure food security and create economic opportunity, to invest in community infrastructure, to protect our natural resources, and finally to sustain a quality of life. Through the next several chapters, the book informs the agricultural operator on the tools he or she would need to remain not only active in agriculture but help the economy and the environment along the way. With the right "Tools and techniques" such as agricultural protection zoning, conservation easements, development rights, tax programs, and several other practices the farmers can learn to fight back and keep not only their pride but their livelihoods.

The next section, and what I feel was the most interesting, was the case studies performed in California, Maryland, and Washington. The case studies focused on these areas due to extreme pressure on the agricultural farmland there to be converted to non-agricultural land for purposes of housing and business. By implementing many of the above tools and techniques much of the land conversion in the target areas has been slowed but not stopped. When evaluated, the case studies allowed the researchers to establish the processes and steps needed to save the farmlands under fire. If there is one thing I remember from this experience it is the "five I's" established from the case studies. Identification, Inventory, Investigation, Integration, and Implementation have revealed probably the best process is designing effective farmland protection. Most important of these is Implementation, as the book states: "The best task force or working group report is of little

value if the proposals are not put into place.”
(p.307).

It is valuable to relate the information I have acquired by looking back at my fathers farming operation. What is it we can do, what do we have to work with, how can we make it work, who can help us, and how do we start? These are immediate as well as long-term challenges to be able to stay in farming.

Submitted by Kyle P. Bell



***Hope, Huma, and Wild: True Stories of Living Lightly on the Earth.* Bill McKibben. Little Brown and Company, New York. 227pages, hard \$22.95, 1995, ISBN# 0-316-56064-2.**

In this simple, but surprisingly real life book Bill McKibben discusses an issue that is definitely relevant to present day. Can countries progress without damaging their lives and the rest of the world? McKibben is very optimistic in his views that they can.

McKibben starts off with stories from his home in New England. He also ends this book with similar stories from other places he called home. He persuades us that it is possible, with the help of others, to make a difference in the environment. His stories are full of hope and promise that environmental problems can be solved. Mr. McKibben offers a new view on life, to have a meaningful one, rather than the life that is expected from society here in the United States.

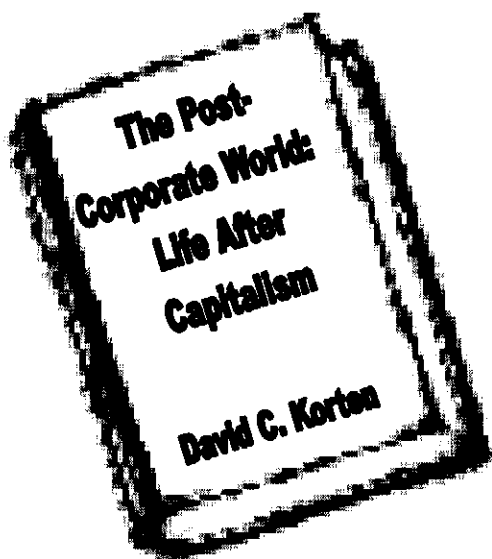
In 1993 McKibben moved to Curitiba, a small city in Brazil where he soon learned the people were on their way to making positive changes to their community. The new mayor, Jaime Lerner, initiated a new

pedestrian mall and transit system which made the town attractive and to him as well as many others. The transit system was a very important function of the city; busses could hold 300 people and more than 1.5 million passengers a day used the system. He also developed cheaper housing for peasants. Later with all of Lerner's accomplishments he became the governor of Parana and eventually made many more changes that intrigued McKibben, such as his work with the president, being an excellent example for other states and counties, and overcoming the myth that good can't come from a poor Third World country.

McKibben soon visited the state of Kerala in India to find that even the poorest of the poor still have hope. Kerala was one of the poorest areas in India with high unemployment and a bad economy, yet he still saw conservative children on their way to school. He also noted that although it was a poverty-stricken atmosphere, the religious communities were there to provide food, land, and education, the building blocks of a decent life. The rise of education in Kerala is what led to the development of a better society.

After McKibben's visits to these Third World countries, he learned that it is not where you are, it is what you make of it and the human spirit is never predictable. I believe that "Hope, Human, and Wild" is a wonderful tribute to what the wild earth is and what a human's hope can do to make it a better place. I feel that it was an excellent eye opener for me as I see our environment in the United State being changed so much. The theory's behind the book are very good but in many cases he makes it seem like it is easy to change the way the things are going in the environment. I feel this would be a good book for anyone interested or has doubt in our environment or economy. It is a good inspiration to change the way's we are treating the environment .

Submitted by Joshua Bowers



***The Post-Corporate World: Life After Capitalism*, David C. Korten. Berrett-Koehler Publishers, San Francisco, California. 317 pages, hard \$27.95, 1998, ISBN 1-57675-051-5.**

As a complete analysis of the structure and effects of capitalism in the United States and elsewhere throughout the entire world, the book *The Post-Corporate World: Life After Capitalism* by David Korten, illuminates the downfalls of this economic theory and describes what will continue to occur if the current market forces are not changed. Citing specific examples of how corporations are the roots of many of the problems in the current system, he explains that many large multinational companies are placing the wrong types of measurements ahead of the common good of life. Comparing what the true market should be to what the current market is, he explains the current forces and corporations as deadly cancer cells that have no boundaries, creating organizations that act as if they do not know any better than to expand at a rate faster than what is expected or possible. In the meantime they forget that they are part of a larger organism, which, in its truly natural state, is to provide a specific function for life. Instead, they continue to reproduce faster and faster, causing harm and ultimately in the

end kill the organism that they were set out to help.

The book is structured so that we understand the effects capitalism is having on the earth and its living components; moving on to a history lesson on how we have reached the point where we are. The book describes the nature of life and how it possible that we have misinterpreted what a true market is and how it is supposed to be operated. Korten then provides a detailed outline and suggestions about how we, as a human race, can begin to change our perspective on the current situation and begin to take steps to better our living environment. He concludes the book by describing success stories of individuals who have begun to internalize many of his suggestions and the effects they are having on the betterment of the earth.

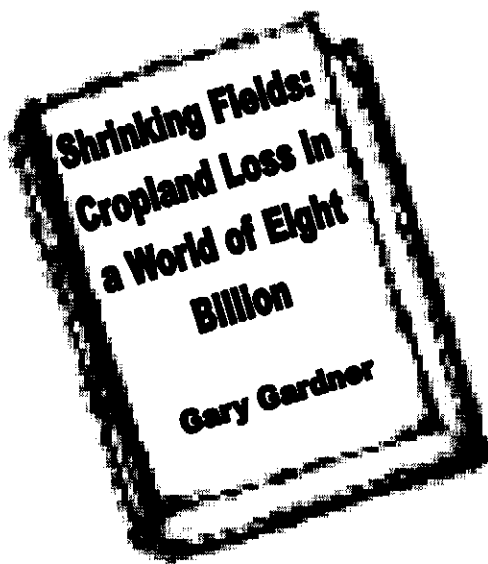
Korten's rich background in research and education has given him the ability to make very convincing arguments in terms of both the natural ecosystem and business and how these two can actually work together. His arguments depicting common economic theory is in line with many economic theories. Describing corporations and their "aggressive growth at all costs" type of management, he points to the fact that these advancements by the huge companies are externalizing many of their costs to the environment and placing them on individuals like you and me. By valuing and basing decisions on financial capital, corporations are harming the underlying principal that gives money value: humanity. He describes a situation where corporations tell us that they are taking steps to improve the natural environment, when in reality they are often leaving the ecosystem in a state of disarray and confusion, providing no great alternative for the land or the people who depend on it in the future.

Korten stresses that to change for the better, we must look at becoming sustainable on a more regional basis. He emphasizes the small community, and those communities being able to provide the majority

of the goods and services for their citizens. Based on the success of these small communities, corporations would lack the incentive to extract resources from living capital at the expense of the ecosystem and life as a whole. Life should be based on what actually gives it value, not the material things such as technology at all cost, and above all, money. It is the simplistic life that gives the value.

Citing specific examples of individuals and groups throughout the globe who have internalized these new ways of thinking, Korten gives us hope for a new and improved way of living beyond the reliance on the large corporations and capitalism as we know it today. It is with these specific examples that the rest of us who have not yet learned or realized the value of this new way of living can reflect upon and begin to see the true nature of what is to become.

Submitted by Joel Clements



***Shrinking fields: cropland loss in a world of eight billion*, Gary Gardner. World-Watch Institute, Washington D.C. 131 pages, paper \$7.54, 1996, ISBN 1-878071-33-5.**

Today's world sees cropland continuously being diminished and degraded worldwide, even with current record-low food reserves. Author Gary Gardner explains why this situation threatens the food security of millions. He explains many different aspects of why and how the loss of cropland across the world jeopardizes the future impact food security will have on the world's ever increasing population. He examines how the once large yield increases are no longer able to fully compensate for the steady elimination of farmland, as was possible in the past. After describing the different ways that cropland is being affected, such as cities devouring farmland, groundwater depletion, degrading land from erosion, and remaining farmland being planted to non-food crops, Gardner gives hints on ways to help solve this worldwide problem.

The author begins by describing the fall of the Sumerian civilization, around 1800 BC, from depleted food reserves, where previously there had been much sur-

plus. Salt, from the byproduct of evaporated irrigation water, slowly began to poison the rich farmland soil of this ancient civilization. Production decreased over time, and soon these people were moving to new, unused farmland that could produce the crops they needed. But after many years of continuously moving and cultivating new land because of salt degrading the old soil, the persistence of this one problem slowly increased in magnitude. The fertile land, that was once plentiful was now gone, leaving farmers trying to produce enough food off of land that was no longer capable of producing sufficient amounts due to degradation. Gardner relates this same problem to today's world. Land that was once bountiful is depleting rapidly, and he asks if there will be a sufficient amount of farmland left to produce enough food for the increasing population in 20 years or more. He states that with a big increase in food demand right around the corner, protection of sustainable farmable cropland is urgently required.

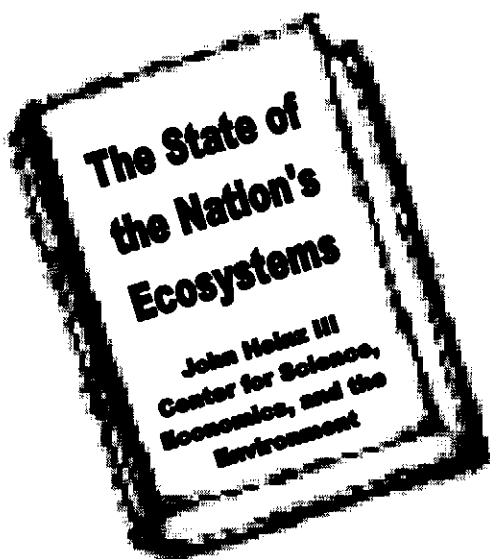
In the past, when land was plentiful, expansion for the growth of cities was easily accommodated, as farmers simply moved to new plots. Today cities are expanding rapidly, and with little new land to be cultivated, cropland losses due to urban expansion are generally net losses. Not only does this expansion pave over cropland, but also it usually paves over the most fertile land, since cities were started mostly in prime agricultural areas. The urban sprawl can swallow up cropland in many different ways, such as construction of factories, houses, infrastructure, and recreational areas like the ever-popular golf courses.

Another major factor, as stated by the author, is the loss of net production from the loss of irrigated cropland and the degradation of valuable cropland. Water sources are depleting, being polluted, or taken by other sectors, stealing valuable irrigation from crops that need the water. Crops will need to be irrigated to produce sustainable amounts of food to counter the net loss of land farmed and the increasing population.

However, the greatest threat to cropland comes not from a bulldozer or city water management, but from the simple degradation of land, Gardner explains. Across the world agricultural practices have eroded, compacted, contaminated, salted, or waterlogged over extensive tracts of land, and the threat this problem poses is extremely underestimated. Before long, similar problems to the ancient Sumerians could be near if nothing is done. With the availability of cropland, the author states that current land does not need to be planted to non-food crops such as cotton and coffee. This land will be needed in food production to help avoid the problems mentioned before.

After careful examination of these problems leading to a future food shortage, Gardner gives simple ideas on how to combat them. These ideas include urban planning for new development, preservation programs for cropland, and new technologies to reduce erosion and other degradation. He states that once policymakers see cropland as a strategic resource, remedies are then straightforward. Using existing cropland more efficiently, as well as fiscal plans, such as implementing more taxes against the development of prime farmland provide useful solutions. New technologies can make agriculture more productive and can reduce the pressures on remaining land. But as the author explains, the challenge is pressing. This is a good factual book for information to understand current problems the future generations will face since our current farmland is now the shrinking foundation of food supply and security.

Submitted by Nick Emanuel



The State of the Nation's Ecosystems. Edited by The John Heinz III Center For Science, Economics and the Environment. Cambridge Univ. Press, The Edinburgh Building, Cambridge, CB2 2RU, U.K. 2002. Paperback, 270 pp, \$25.00. ISBN 0-521-52572-1.

As a comprehensive reference and assessment of current U.S. ecosystems this book attempts to provide indicators of the health and long-term sustainability of resources in key sectors of the environment. Its purpose is to provide the first in a series of periodic benchmarks that will allow us to track the situation and determine whether national policies and local practices are having an impact on the large ecosystems on which survival depends for humans and other species. As stated in the overview, this book "provides a prescription for taking the pulse of America's [sic] lands and waters."

Among the array of statistics available today, we are all familiar with indicators used to track the economy – gross national product, interest rates, and others. The authors of *The State of the Nation's Ecosystems* suggest that no parallel set of indicators has been compiled for periodically measuring our country's ecosystems. One could argue that other sources such as *Vital Signs* from WorldWatch Institute or the *Environ-*

mental Almanac from Houghton—Mifflin do provide much of this information, yet this new book presents these indicators in a fresh and graphic way that is easily accessible to high school and college students as well as seasoned researchers and educators.

Described by the authors as a "massive work in progress," the book was assembled by an impressive team of more than 150 experts who provide here a "fair and balanced evaluation of the environment around us." Coming from the business community, academia, government agencies, and non-profit environmental and other groups, the participants represent a Who's Who in science. As critical observers, they readily admit up front that the book is incomplete, and an ambitious work in progress. Their self-imposed charge was to be scientifically credible, non-partisan, authoritative, and flexible, bringing in new data for future reports as conditions change.

The State of the Nation's Ecosystems reports on indicators of the health of the environment including sections on Coasts and Oceans, Farmlands, Forests, Fresh Waters, Grasslands and Shrublands, and Urban and Suburban Areas. For each indicator in each category, the authors have determined whether there is adequate data to clearly assess the situation, partial data, inadequate data for reporting, or further need to refine the indicator itself. They anticipate an updating of this report and more complete treatment of the indicators in each successive book, planned to be published every five years.

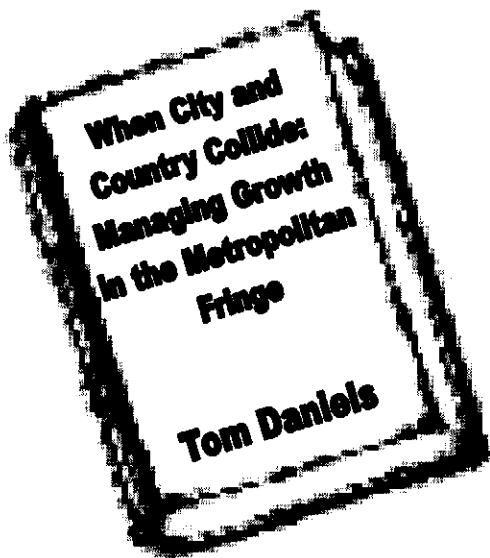
Of special interest to agronomists is the Farmland section, one that has a more complete data set than any other, with 18 indicators that include among others the cropland available and the state of the rural landscape. Specific measures such as nitrate, phosphorus, pesticides, and soil erosion have adequate data sets for reporting, while data on others such as soil organic matter, salinity, overall soil biological condition, and recreation in farmland areas were deemed inadequate for national reporting.

Status of wildlife, native vegetation, and stream habitat quality were considered indicators in need of further development to be useful for planners and others concerned about ecosystem health. In contrast, another sector of interest to agronomists is Grasslands and Shrublands, and there is a less complete data base available and more need for better information in order to develop indicators of current conditions.

In my opinion, this is an incredible project that will be extremely valuable for planning, setting national and regional policy, and charting decisions that can lead to a more desirable future rural landscape. The credentials of the participants in the data gathering and interpretation are impeccable, and they represent such a wide range of organizations and disciplines that it would be impossible to discredit their work. In the current political climate, where results of scientific inquiry appear to be interpreted or ignored fit the needs of special interest groups (eg. debate on global warming), a report from this broad group of scientists should leave no room for such misinterpretation. They have written about highly technical processes and conditions in terms that can be understood by the educated lay person. This should be a valuable resource for policy makers. We should complement the Heinz Center for Science, Economics and Environment as well as Cambridge University Press for taking on such a large, long-term and expensive project. Our future generations will thank these visionary people who have dedicated long hours to the activity, and promise to keep up the effort for future reports. This, finally, is one embodiment of the Native American philosophy of planning as if the future were important, looking at least seven generations ahead to anticipate the impacts of our decisions today. *The State of the Nation's Ecosystems* provides the data and benchmarks to make this possibility a reality in national and local planning.

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***When City and Country Collide: Managing Growth in the Metropolitan Fringe*, Tom Daniels. Island Press, Washington D.C, 20009. 377 pages, paper \$32.50, 1999, ISBN 1-55963-597-5.**

The book, *When City and Country Collide*, (CCC) is a dramatic, proactive and reactionary look to the transformation of United States rural landscape, also called open space, to a growing metropolitan fringe development. This population growth is changing the landscape of the United States and is becoming a national economic, political and environmental concern. CCC is an in-depth review of our national fringe growth and also looks at the impact on the cities and communities, each with unique identities, characteristics and problems. This book describes and illustrates several ways to achieve more sustainable and balanced communities in the rural and urban fringe. Daniels suggests a key ingredient to sustainable communities in the fringe is to "maintain rural industries that provide open space and rural character that fringe residents cherish". The landscape provides crops, food, and other pleasures and necessities for humans to prosper.

Daniels believes that growth management is the best approach for communi-

ties to plan for their future growth. He describes the national, state, regional and local sprawl growth (Chapters on each) as a major concern and that there is a need to manage this growth by all levels of government agencies working together. City Council officials, mayors, state senators and national congress members can provide guidance for a successful future for communities.

Daniels shows practical examples of "schools of planning" which would provide viable options for local communities and elected officials looking to the future of sustainable communities. Schools of planning require officials to have an appreciation and understanding of the local environment, the financial support structure of the community and an attractive appearance for the new community.

Daniels also believes national leadership from those governmental agencies in the Departments of USDA, Transportation, EPA, IRS and Rural Housing and Development are vitally important but, "the federal government has no overall vision for the future of the rural and urban fringe". Each department has policies and procedures, but a cooperative plan needs to be in place for streamline efficiency. To complicate this landscape development, federal tax policy creates incentives for new home construction; federal highway construction grants are creating mega-metropolitan transportation systems; USDA agricultural programs through the Farm Service Agency have not addressed the loss of prime farmland to fringe development; EPA through federal laws and enforcement of the Clean Air Act and Safe Drinking Water standards holds the power and potential to limit growth of the fringe sprawl. Daniels suggests "Major changes to federal spending and tax policies are needed to revitalize central cities into desirable places to many, if not most, Americans to live". Daniels believes federal programs like the

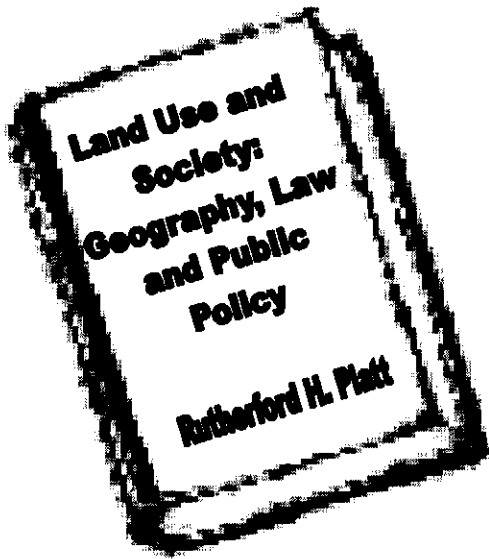
Intermodal Surface Transportation Efficiency Act, (ISTEA), will impact fringe growth.

Managing this fringe growth becomes a state and local planning process. By having local land use and zoning regulations in place, the balance occurs between rural landscape and fringe population growth with open space, green acres or effective boundaries to filter the effects of population, pollution and also the agricultural technology ingredients of fertilizer and chemicals. Growth management emerges from government spending policies, taxation and the regulatory programs to create the desired community. The concept "growth means prosperity" can have mixed meanings but can be a short-term fix to long-term problems, unless properly planned for. Politicians promote economic and fringe growth for sustainable communities, but at a price to the local economy, environment and taxpayers. The author suggests, "Growth management is not a well articulated issue". Voters are more concerned about taxes, speedy highways, recreation, industrial and commercial employment and the services provided by local governments. Local officials want to be reelected and forget the relationship between growth management and sprawl. Growth management can be pro-growth, balanced growth or no-or slow growth. As land acreage becomes less available, fewer acres result in less productivity of the agricultural industry. "Fringe countryside presents major growth management challenges because of the large area and competing demands for land. While suburbs are often concerned with maintaining some open space in their communities, many fringe areas still have viable farms and forestry operations that are worth protecting". Urban growth boundaries can be used and some states are regulating growth, which holds promise for growth planning. These boundaries can control the

infrastructure and protect greenbelts of farmland and open space between fringe growths. This book provides excellent examples of cities and communities that are using to create a balance between growth and the countryside. The regulations and incentives for protecting green space vary throughout the United States. CCC illustrates the importance of local control to the future direction desired by local planners.

Daniels provides examples for ways to provide for a healthy and prosperous balance between people, land and environment in practical applicable dimensions. Balanced growth planning and growth management enable communities to sustain. The book suggests, "The opportunities of growth management in the fringe are encouraging. Core cities, suburbs, edge cities, counties and municipal governments will need to cooperate more closely. Regional metropolitan planning for infrastructure and land use will be essential. If regional planning fails, the financial, social and environmental costs to America will be enormous". The real importance is maintaining a balanced food production system, environmentally healthy ecosystems and population growth for community happiness.

Submitted by Ed George



Land Use and Society: Geography, Law and Public Policy, Rutherford H. Platt. Island Press, Washington D.C. 20009. 493 pages, paper \$35.00, 1996, ISBN 1-55963-435-9.

This book could be a valuable reference for anyone studying history, geography, land use and planning, architecture, law, public policy, politics and many other disciplines. The book details the development of European and United States cities starting back several centuries ago to the present. I found the topics most interesting that described how many cities that I have visited were planned and the reasons why they look they way they do.

The book is divided into four sections: Land Uses and Concepts; From Commons to Cacophony: Dispersion of Control over Land; Reinventing Cities: Testing the Limits of Intervention; and The Search for Broader Land Use Policies. The discussions on early land use in Europe including the reasons behind city development, the events that changed their look, and how they grew is a lesson on European History. These lessons were implemented in the United States. The book explains early adaptation of water and sewer systems in this country and how such systems have evolved over time. The history of the development of many United

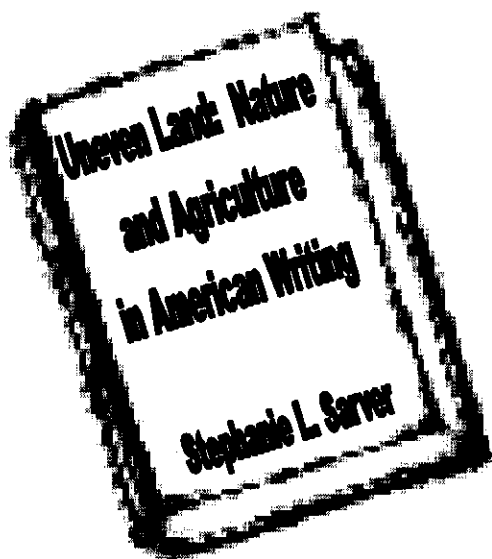
States cities is explored, giving a variety of reasons why cities are different from one another.

Platt takes a close look at land use legal cases from the last century and how they have affected land use policy. The connection between these court decisions and how zoning decisions have come to play into land use policy are examined. Platt also is very detailed in explaining the interaction between geography and law in land use policy. The book introduces the figures in history who have made an impact on land use policy and those individuals who have played a role in the design and make up of cities in Europe and the United States. I found most interesting two cities I have visited, Paris and Washington

D.C., were both influenced by the same man, Baron Georges-Eugene Haussmann. I did not pay attention to those similarities until I read the book.

Platt discusses some of the unmet needs of land use planning and regulation in the United States and gives the reader some food for thought. I highly recommend this book for anyone who is a student in land use planning, civil engineering, architecture, real estate, law or government. The book is a valuable history of the past several centuries of land use and gives the reader a foundation for the current reality. This book is a wonderful reference.

Submitted by Dean Lesoing



***Uneven Land: Nature and Agriculture in American Writing*, Stephanie L. Sarver. University of Nebraska Press, Lincoln, Nebraska. 207 pages, hard \$45.00, 1999, ISBN 0-8032-4252-2.**

In sampling the works of various nineteenth and early twentieth century American writers, Stephanie Sarver illustrates views of the American landscape which are quite diverse but also by and large very romantic. Some portions look at farming as an ultimate dream of many people. In this book, Sarver explores the relationships that humans have had in recent history to nature and the land. Through the writing she studies, Sarver takes a look at farming as not a subject but a context to human experience.

In the introduction, Sarver states that Jefferson saw property ownership as a fundamental human right, a belief that could be related to for the problems associated with the urban sprawl of today. If not for the ideals that Jefferson instilled in the public of his time, people may not have the sense of entitlement to land as many do today.

A very important part of understanding human relationships with nature is understanding that people have very different definitions of nature. Most definitions of

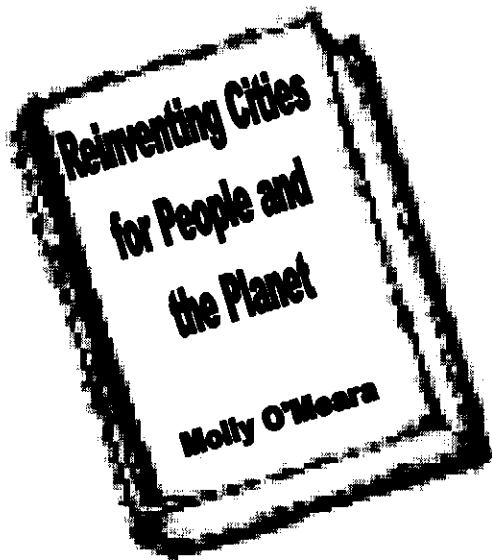
nature exclude humans and human activity. Some go so far as to say that nature is all things not involving humans. Sarver uses this common definition in discussing nature throughout most of the text, but also states that humans could be considered a part of nature with our agriculture as an inherently natural expression of our efforts to survive. The writers' definitions of beauty also differ greatly, contributing to differences in attitudes towards the land.

As is to be expected by the title, Sarver looks at human attitudes toward the land through the eyes or words of writers such as Thomas Jefferson, Ralph Waldo Emerson, Frank Norris, Liberty Hyde Bailey and Hamlin Garland. The differing educations and backgrounds of the writers lead to somewhat predictable differences in their writing on the land. Emerson writes of the land in a manner which is very metaphorical and philosophical. Garland, who was not able to receive the same kind of formal education as the likes of Emerson, has a view which is more literal and not as romantic or philosophical. More of the hardships of farming can be seen in Garland's writing than in Emerson's. Norris and Emerson complicate the idea of the farm, using agricultural themes to explore economics and politics. Some of the other authors actually write about the farm itself.

To a person who is not well versed in American Literature, this book is somewhat intimidating. Many of the themes are highly philosophical. I expected to read more about the actual farms and land in literature, but that is not what Sarver writes about in this book. This book is more about the people who live on the land than the land itself.

Like many of the authors she writes about, she complicates what are expected by some to be simple themes. I would recommend this book to those who have prior knowledge of or want to learn more about the writers that Sarver uses in her examples of literature on the land.

Submitted by Andee McGinn



***Reinventing Cities for People and the Planet*, Molly O'Meara. Worldwatch Paper 147, Washington D.C.. 94 pages, paper \$3.75, June 1999, ISBN 1-87807-149-1.**

This book is concerned with six areas including land use, transportation, water, waste, food, and energy. Molly O'Meara discusses these items in detail and addresses potential solutions to each. Furthermore, within each category, she states a brief history to allow the reader to understand how we got to where we are today. This paper does a good job of giving the reader a chronological pathway from early to current patterns of human settlements.

The section on transportation and land use contains a comparison of the U.S. and several other selected cities in the industrialized world. The author does a reasonable job of showing how the impact of suburban sprawl has caused many problems in the U.S. which have not been experienced at nearly the same level in the other case studies. By use of several charts, the author conveys the point that the average car use in the U.S. is nearly double that of the other industrialized countries. In addition, she shows us that this trend is worsening. These

arguments paint a scary picture for the future of the U.S. as the population increases geometrically. The paper allows the reader to fully understand the implications of such growth on the natural resources affected by the cities.

Further discussion on land use shows what is being done to solve this dilemma. While other books only state the problems with cities today, O'Meara tells us what is being done to mitigate these problems. I found this to be the most interesting, hopeful, and useful aspect of the paper. Merely telling the reader about the world's problems is easy. Because the author discusses possible and current solutions to these problems not only in transportation and land use, but also within the other areas of concentration, this book became not only an information source but also a useful resource in creating ideas of what can be done to limit resource degradation.

The food production section of the paper discussed several interesting points. For example, O'Meara tells how the developed world contains farming regions which have uniform seed supplies based on the available suppliers in the area. This has caused an increase in the vulnerability of the region's food supply because they all contain generally the same genetic make-up. Furthermore, the book states that nearly 15% of the world food supply is produced by urban farmers. These interesting bites of information help to maintain the reader's interest and urge them to continue reading.

In dealing with energy conservation, the author talks about systems in place within urban areas that utilize products from industry and power production more efficiently. The paper states that cities in Europe are currently using excess heat from power production to heat cities through the use of a district heating system. This was

quite intriguing considering the amount of energy our country allows to be wasted.

The author spends some time speaking about financial issues within cities. It was a bit disappointing to find that the solutions given to municipal money woes were to tax the citizens more. She states that if cities are providing services, they should have the money to adequately pay for them.

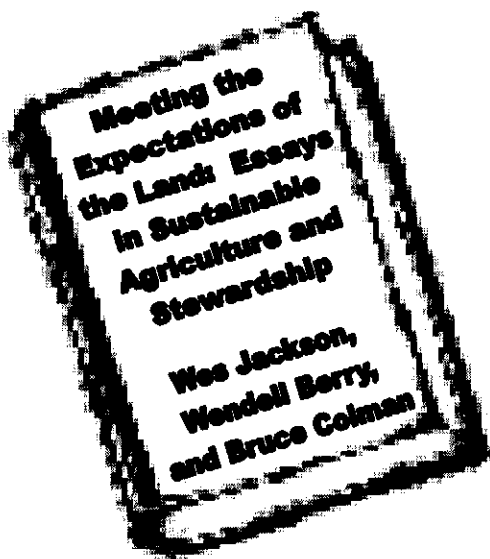
My concern here is that cities often do have the money to pay for the services, however, they waste the money on inefficiencies and unnecessary programs. The author states that raising taxes and fees is necessary to provide for a sustainable city. I find this statement false and believe that the best way to provide a viable economy and better quality of life is to limit taxes.

The author clearly represents a pro-government point of view, and doesn't believe that private enterprise is trustworthy. These scarcely hidden innuendos are a bit overwhelming at times in the report.

I think the author should have spent more time discussing the six resources areas, and less time discussing financial and political solutions to the problem.

Overall, I found this paper to be quite enlightening on what has occurred with our natural resource degradation. However, I have found out that measures are being put in place to prevent the further decay in many areas. These measures may work in other industrialized countries, but I'm not so sure they will work here, at least in the near term.

Submitted by Jered Morris



***Meeting the Expectations of the Land: Essays in Sustainable Agriculture and Stewardship*, Wes Jackson, Wendell Berry, and Bruce Colman, (eds). San Francisco, North Point Press. 250 pages, preface and acknowledgements, introduction, table of metric equivalents, notes, paper \$12.50 new (out of print, price varies), 1984, ISBN: 0-86547-172-X.**

This is an excellent book, and though it is nearly two decades old, we find—however disconcertingly—that it is still much ahead of its time. While edited compilations are difficult to review, I will focus on those aspects of the work that may engage urbanites concerned with sprawl and its ongoing consumption of farmland. As the title suggests, this book illuminates attitudinal changes toward the land that are necessary if we are to move into a sustainable relationship with the earth, for farmers and urbanites alike. Both sectors of the population are implicated in sprawl, though it is urbanites who control the economic paradigms that have insisted that land be viewed merely as a commodity of the capitalistic machine—farmland as open space awaiting “higher” development.

The book consists of seventeen essays written by a variety of contributors, who together constitute a “Who’s Who” of

individuals at the center of sustainable thinking. Some essays are broadly philosophical in approach, while others focus on specific issues concerning our current worldview of agriculture, attempting to bring them into larger ecological focus. Gene Logsdon leads with his essay on traditional farming practice, illuminating the agroeco-logic that was embedded in that system, but which has long-since been lost to the specialization of commodity monoculture. Wendell Berry follows with an exposition of the multiple ways in which modern urban scientific rationalism has taken over the farm sector, sometimes through persuasion, sometimes through outright control mechanisms. Traditional farming’s sensitivity to the land was lost as farmers more-and-more started to think like disembodied urban experts and bureaucrats. Donald Worster then introduces an ethical view of the situation, arguing that a return to healthy farming practice would produce a healthy and just society that preserves the earth and its network of living systems.

The next two essays—Hans Jenny on soil and Donald Worster on the hydrological cycle—illuminate principles of critical importance for even urban understanding. Soil is not just dirt, and water is not just H₂O. Rather, they are essential constituents of highly complex interconnected systems that have been extremely disrupted, much to the detriment of earth’s living systems and with adverse impacts on human sustainability. It is important for urban people to have at least rudimentary understanding of these complexes, for they are directly impacted by our food choices.

These essays are followed by equally engaging ones on energy, alternative forms of energy, urban gardening, economics, land trusts, American agriculture’s impact abroad, stewardship practices, agroecology, and desert agriculture using native plants. Wes Jackson and Marty Bender follow with an essay on the perennial polyculture research that has put Jackson’s Land Institute

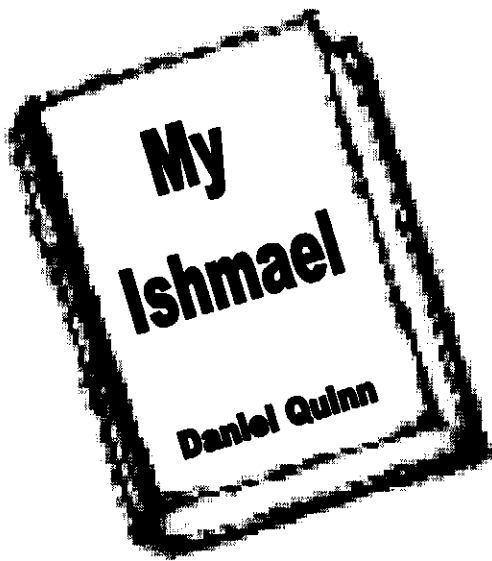
on the map, via its attempts to find ways to work within the native regimes of the land itself. The next essay by Gary Snyder (the only one to be reprinted from elsewhere), brings the compilation full circle, and beyond. I say beyond, because it takes the essays beyond agroecological concern to a broader concern with the basic ground of our existence on this planet—the wild, self-organizing systems we call “nature.” This profound essay should be read by all, especially those who may not yet appreciate the foundations the biosphere, within which we must develop more appropriate paradigms for sustainability.

Wes Jackson’s concluding essay seeks to integrate the concerns of all the essays into a unifying concept for sustainable agriculture. This is an ambitious and somewhat technical essay, but one that is still highly readable. It is important, for he tries to discover a concept of agriculture that is keyed to nature and natural ecosystems. He employs ecological principles to uncover his concept: a hierarchy of structure among entities that have spatial and temporal extension, with the ecosystem above organisms; integrative levels, which are implicated in the emergence of the entities; and hierarchies of descent among species and populations, as boundaries of biological information. He then illuminates the interactions of scale, information, and energy that are common to the hierarchies, and that maintain the vitality of the whole system. The essay, and the book as a whole, lays the groundwork for Jackson’s seminal work, *Becoming Native to This Place*, published a decade later.

At the very least, urbanites should find this book compelling for exposing the illogic of our current agriculture paradigm, and to help us to understand the trajectories that must be taken to develop a new one. Agricultural land—like urban land—is not just property bounded by lines in abstract flat space, as on land use maps. Land uses are not simply interchangeable, based merely upon the disembodied values

economists imagine to be a “bottom line.” This book exposes the complexities of conditions and the shifts in attitude that must be addressed to form a sustainable food system for humans. I can’t help but imagine that, if farmers were able to get their act together, they would force the urban world to get ours together as well.

Submitted by D. Murphy



***My Ishmael*, Daniel Quinn. Bantam Books, New York, NY. 288 pages, paper \$15.95, 1997, ISBN 0-553-37965-8.**

MY ISHMAEL is a sequel to the book *ISHMAEL*. Both books begin with an individual noticing an advertisement placed in the newspaper. This advertisement is notification of a teacher seeking student, who must have a desire to save the world. In *ISHMAEL* the student is attracted by the advertisement because he once had an earnest desire to save the world, but with age has become a skeptic to the idea. In *MY ISHMAEL*, the student is attracted to the advertisement because of a desire to change the conditions in which she lives and because, as a 12-year-old, she has time to waste. Because of the difference in the individual students, the outcomes of each of their efforts to learn are very different. They both came to the teacher with a different view of the world and therefore receive different lessons as a result.

Similar to *ISHMAEL*, this book does a very good job of covering the history of the world and how things came to be as they are today. It does this in relatively few pages and in an entertaining way. The teacher is unique in both his methods, which he describes as the miaieutic teachers' method, and in his species, Gorilla. The

miaieutic teaching method brings to life ideas that have been growing inside the student. Resulting in the story that each student receives of how things came to be as they are today being different.

In *MY ISHMAEL*, the student is a 12-year-old girl by the name of Julie Gerchak. The teacher first rebuffs Julie because of her age. After Julie explains her reason for wanting to save the world as a fear of what is transpiring and a desire to just leave this world to find solutions, Ishmael agrees to take her on as a pupil. In their first session Julie relates her hope that this situation would lead her to leaving the earth to search the universe for an example of how to live sustainable on one's planet. This leads Ishmael to ask why this example cannot be learned from some culture on earth. Julie is unaware of the meaning of culture and so the lessons begin.

Ishmael explains the beginning of Julie's culture as the onset of putting food under lock and key. In addition, this culture poses the opinion that humans are greedy, miserable, destructive and that they are this way not because of their individual choices but because they're human. Ishmael explains the theory of evolution by fictitious examples that actually relate to real examples observed on earth. These examples deal with the competition of species in order to pass on genetic material. It is discovered that if a method of competition did not work, the species would not survive. In addition, competition between groups of a species would need to work for the species to survive. The erratic retaliator strategy, used by tribes successfully for millions of years, was to give as good as you get, and when threatened back down sometimes and fight others and every so often, attack to keep the other tribe guessing.

With the beginning of cultivated agriculture around 10,000 years ago this strategy changed, and with increased food production populations exploded. To get people to help produce more food, it was put under lock and key. When more land was

needed, the agricultural culture moved into the pastoral culture's land. The pastoral cultures were removed forcibly or put on reservations. The agriculturalists believed that their way was the right way to live and that they had taken things into their own hands, as the world was made for them to rule. The pastoral culture had long existed on the belief that they belonged to the earth, just as all the other animals that roamed the landscape. In this manner the pastorales lived sustainable lives on the earth for millions of years before the dawn of intensive agriculture.

Today the culture of our society is taught to its new members, its children, through things such as educational institutions and the advertisements of mass media. This dialog of what society has defined culture to be, is called the voice of Mother Culture by Ishmael. Education keeps kids from working while they learn how to be productive members of the culture. Advertisements develop perceived needs for the goods of production that must have consumers to continue the economic development of culture. Workers continue to work more hours to receive more money to purchase things perceived to make them happy. This voice of Mother Culture perpetuates both the treadmill of consumption and production which results in increased disorganization of both community and the environment. This is not a sustainable culture, and the voice of Mother Culture is so ingrained in the majority its members that they think her voice are their own.

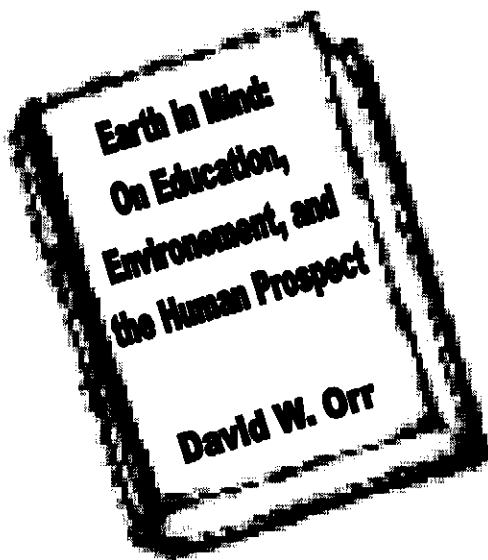
Ishmael, in his lessons, is attempting to impress upon his student the need for this agriculturalist culture to learn how to live sustainable from the few remnants of the sustainable cultures left. The problem is that the agriculturalist culture feels they are living the right way and that the sustainable way is primitive. Therefore, where every sustainable culture is encountered on the planet the agriculturalist push them aside to make better use of the land they live on. A good example is the current debate about drilling for oil in the Arctic Wildlife Ref-

uge's 1002 lands. Currently the Gwitchen tribe depends on the caribou that use this coastal plain as their calving grounds for their sustainable culture. If our modern agriculturalist culture and its need for fossil fuels disrupt these calving grounds to make better use of the land, yet another culture that can teach us how to live sustainable will be lost.

In this book it is impressed upon the reader that each individual "student" must develop their own method to teach others about the need to change the voice of Mother Culture. One must find a way to change the voice, because it is not enough to simply shut off the voice. The voice has become so much a part of our culture that a new voice, creating a sustainable culture, must replace it. Ishmael impresses this upon the reader by a sign that hangs in his classroom. At the beginning of the book the sign reads, Without Man, Can Ape Survive? At the end of the book this sign reads, Without Ape, Can Man Survive? Ishmael is attempting to change the voice of Mother Culture through a few students that will each teach a few more and in this way thousands will be taught to listen to a new voice.

I would recommend this book to anyone who feels that something needs to be done to change the course that our culture is on. The increased consumption and production that expand our economy are also destroying the planet. The book offers some insight into why this occurs and can teach someone to look at the bigger picture. For this reason I feel that anyone who doesn't think that the unsustainable economies our culture supports are destroying the planet should also read this book. Maybe a few behaviors can be changed every time a new voice is created and we will still have resources available for our children's children live sustainable lives with.

Submitted by James Newman



***Earth in Mind: On Education, Environment, and the Human Prospect*, David W. Orr. Island Press, Washington D.C. 20009. 213 pages, paper \$19.95, 1994, ISBN 1-55963-295-X.**

"Human breast milk often contains more toxins than are permissible in milk sold by dairies.....At death, human bodies often contain enough toxins and heavy metals to be classified as hazardous waste.....U.S. industry releases some 11.4 billion tons of hazardous wastes to the environment each year" (p.1). These are but a few of the statistics mentioned in the introduction to David Orr's book, *Earth in Mind*. He follows closely with the statement that we continue to educate our young as if there were no real planetary emergency, and sounds a rally cry for educators everywhere to become "students of the ecologically proficient mind and of the things that must be done to foster such minds" (p.3). Orr's belief that contemporary environmental crises originate with the inability to think about ecological patterns, systems of causation, and the long-term effects of human actions leads to his assertion that an all-out redesign of education itself is the only option for a healthy, sustainable future.

The book is a collection of essays written by the author between 1990 and 1993 that are placed into four distinct sec-

tions: (1) "The Problem of Education", (2) "First Principles", (3) "Rethinking Education", and (4) "Destinations". This layout provides a logical framework for the exploration of many facets of the educational system, educational psychology and links to the natural world, problems within institutions and society as a whole, and enlightened suggestions for methods of improvement and redesign of education.

One of Orr's underlying theses is that there is not a problem *in* education, rather there is a problem *of* education. The modern industrial world is a product of education, and those high-ranking officials and decision-makers at all levels are thought to be highly educated. Corporate and governmental decisions that are harmful to the environment, and thus to the future of all living things, are made by persons with college degrees. A comparison between Albert Speer, Hitler's Minister of Armaments, and Aldo Leopold, is made. Both men came from a similar economic class and received similar levels of education. One man, however, was able to help organize the most infamous genocide of our time, while the other is known as the "Father of Conservation" and is well respected for his philosophies and actions. This comparison illustrates the point that education alone does not lead to intelligence, "the where-withal to think about the big issues nor the good sense to call these by their right names" (p. 20). Education has often rendered students narrow technicians who are primarily concerned with making a living before searching for a calling and a true sense of self, while at the same time, deadening the innate sense of wonder for the created world (p. 24). In other words, "Speers" are more likely products of the system than "Leopolds".

On its way to becoming an institution that inadvertently produces ecologically-numb technicians, education has lost sight of some of the first principles of life and learning. The book's second section includes essays about such principles that al-

low us to ask the important questions of the human condition, while searching for connections between component parts: love, intelligence, wisdom, virtue, responsibility, value and good sense are explored. Orr states that most of what now passes for intelligence is actually just cleverness, or short-term preoccupation that tends toward fragmentation. True wisdom and intelligence, he thinks, can only be achieved when love and passion drive our effort to acquire knowledge, and virtue and responsibility guide the search. He cites politics and economics as impediments to the education that is needed, and also points out fallacies and misconceptions within both arenas. A strong message is that our reliance upon oil and our separation from the natural world are key to the problems we face today.

The third section of the book, "Rethinking Education", offers suggestions for moving the system toward a more sustainable and ecologically responsible path. A main idea is that academic pigeon-holing is detrimental to progress, and that in order to more effectively confront problems, students must broaden their focus of study and understanding through practical experience. He notes that the loss of farms in this country and the shift to industrial farming has had serious consequences on our "collective ecological intelligence" (p. 117). The farm functioned as a place to teach stewardship of the land, and the revival of college farms is greatly needed.

Finally, the "Destinations" section offers ideas about where education should go, and methods for how it should get there. Orr states:

Education has become a homogenizing force undermining local knowledge, indigenous languages, and the self-confidence of placed people. It has become an adjunct to the commercial economy (p. 129). He goes on to say that:

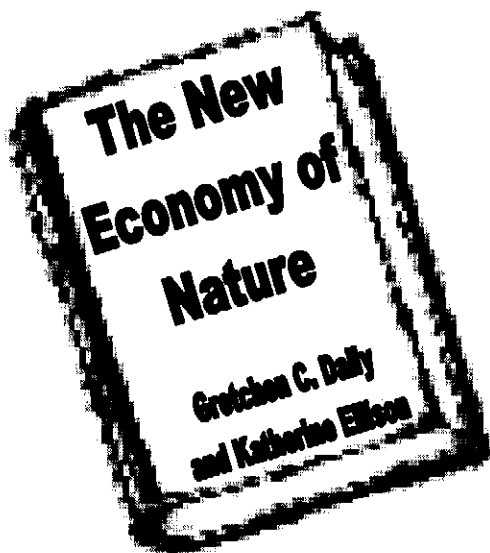
For our politics to work as they now do, a large number of people must not like any nature that cannot be repackaged and sold

back to them (p. 136).

E.O. Wilson's hypothesis of "biophilia", or "the urge to affiliate with other forms of life" (p. 132) is offered as evidence that humans are linked to the environment, and that learning cannot be viewed as separate from the ecological systems in which we live. Orr also believes that we must educate about localities, and encourage students to "love your place" in order to re-illuminate the bond humans have with nature, as well as the love of place that is necessary for the success of conservation efforts. An exploration of the true costs of food in the U.S. and of the discrepancy between "cost" and "price" is also given using rural and urban examples.

In the book's conclusion, Orr states that the root of the word education is *educe* which means "to draw out". He follows that, "What needs to be drawn out is our affinity for life", and quotes Dave Foreman that the task of education is to help us "open our souls to love this glorious, luxuriant, animated planet" (p. 205). Contemplation of nature and study of ecological systems will assist us on this path if we allow ourselves to be touched by such grace.

Submitted by Mindi Schneider



***The New Economy of Nature*, Gretchen C. Daily and Katherine Ellison. Island Press, Washington D.C., 2009. 242 pages, hard \$17.50, 2002, ISBN 1-55963-945-8.**

The main premise or concern of *The New Economy of Nature* is, "how to measure, capture, and protect these newly discovered values before they are lost." Put simply, the book seeks to examine and provide examples of how to make society cognizant that ecosystem services can be capital assets that will ultimately lead to a healthy and sustainable environment.

The book emphasizes that economy and ecology do not need to be mutually exclusive, but, in fact, can work together to protect our most valuable natural resources. This involves establishing ownership of natural capital and finding innovative and creative financial incentives for environmental conservation. Once the connection has been made that ecosystem services are assets, the simple economic law of supply and demand can be applied to fully understand how market forces can be used to save our natural resources.

The book continues with providing real life examples of how unique strategic marketing and economic strategies can be utilized to encourage environmental conservation. The authors give several examples

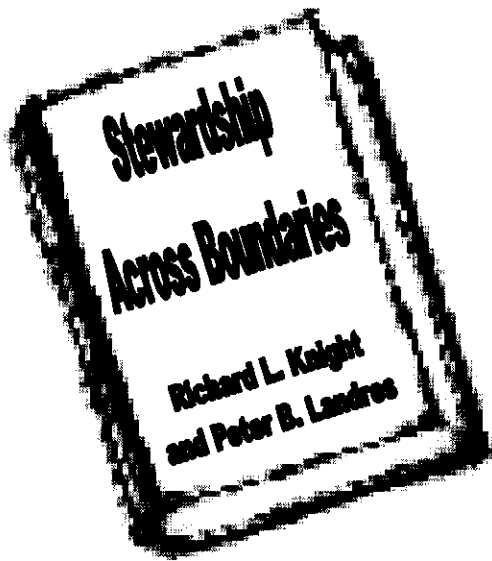
of how it is more economically viable to use Mother Nature's ecosystem services as opposed to relying on society's technological solutions. New York City's (NYC) battle with the Environmental Protection Agency to save their surface water supply is an excellent case study for the future. In essence, NYC was able to broker a deal with the EPA that allowed them to avoid installing expensive filtration and water treatment plants by drafting and implementing a watershed protection and conservation program. Even though costs started rising as the project progressed, letting Nature utilize ecosystem services was less expensive than installing an expensive water treatment system. In addition, not only did utilizing ecosystem services save NYC money, it also benefitted the environment through improving land-use practices. NYC's story is one of some delicate balances among politics, the environment, and economics.

The example of purchasing degraded land in Australia and transforming it into a sanctuary for native species of plants and animals provides an excellent example of how conservation can be made profitable through the Australian stock market.

There are several other superb stories that are told with vivid detail about how our natural resources can be transformed into being perceived as valuable assets.

Overall, the book reads extremely well with the authors' writing style captivating the reader into wanting to read and learn more about these truly revolutionary sustainable marketing strategies to save our planet. This book is a must read for anyone who is interested in making a difference to save our planet through the use of unique natural resource conservation strategies.

Submitted by Chris Schroeder



***Stewardship Across Boundaries*, Richard L. Knight & Peter B. Landres (eds). Island Press, Washington D.C., 2009. 371 pages, paper \$19.95, 1998, ISBN: 1-55963-516-9**

Stewardship Across Boundaries is a book comprised of the views of twenty-five different authors, two of whom double as the editors of the book. The book is divided into four different sections including: Understanding Administrative Boundaries and Their Effects, Types of Administrative Boundaries, Case Studies, and Building Bridges Across Boundaries. These sections contain three to five chapters that serve to explain the topics in greater detail. The editors decided to limit the issues addressed in this book to those regarding the United States to help keep the broad topic more consolidated.

The first section, "Understanding Administrative Boundaries and Their Effects," investigates the legal/political, ecological, social, and human characteristics of boundaries. In the first chapter, Eric T. Freyfogle uses two well-known pieces of literature, Robert Frost's poem "Mending Wall," and Wendell Berry's short story "The Boundary," to assist the reader in understanding contradictions involving boundary regulators. This is an excellent way to pull otherwise unrelated literature into explora-

tion of boundaries. The three chapters that follow delve into the ecological, social and legal facets of boundaries. Among these three chapters, one can gain an excellent picture of the different aspects and issues challenging stewardship across boundaries.

The second part of the book, "Types of Administrative Boundaries," examines the different types of boundaries found within natural environments and their effects on the surroundings. From topics on private forests to public recreation areas, these chapters offer views that are usually not otherwise available in the public realm. Once again the authors have provided the reader with an eye opening view of how agencies put boundaries on land that would have been better off without them. This section concludes with a chapter on boundaries between public and private lands. It also discusses the lack of communication between agencies and the individual owners of the land, which promotes harmful effects to the land.

In the next section, the editors include five different case studies that address issues facing a wide array of lands and their uses. From challenges in The Big Cypress Nation Reserve to overcoming boundary difficulties in the Yellowstone ecosystem, these five case studies offer an "insiders" view on problems already encountered and the responsive actions taken. These five examples show how administrative boundaries can be overcome to promote the betterment of the natural environment and the resources found within it.

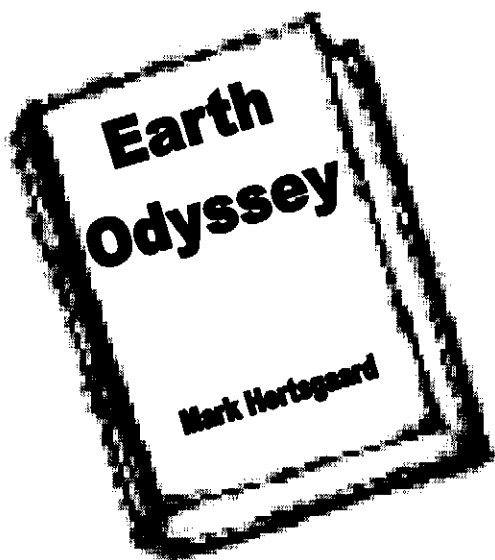
The final section of the book is titled "Building Bridges Across Boundaries." This section strives to find answers to the challenges facing cross boundary stewardship and provides an excellent finish to the book. It concludes with the various authors' replies to many of the issues and questions posed in the previous chapters. In the first chapter of the final section author Steve Yaffee makes the statement, "We preach cooperation while we practice competition," which shows the necessity for everyone to let down their guard a little to help in the

promotion of the environment and the betterment of our natural environment.

This book illustrates that stewardship is needed on all scales, from urban landscapes owned by private citizens, to huge national forests conserved by governmental agencies. The way the book is laid out helps the reader more fully understand stewardship and all of its impacts. By starting the book with a section describing boundaries, and flowing to an ending on how to bridge the gap between these boundaries, the reader becomes fully educated on all aspects of stewardship.

The editors and authors have done an excellent job of incorporating all dimensions of stewardship and its effects. Although I did detect some prejudice from a few of the authors, it was not enough to make the book undesirable. This book is written on a level that no matter what your educational background, you will be able to comprehend all aspects of the book. This is an excellent book for those aspiring to learn more about how they can assist in preserving the environment long after their individual lifetime.

Submitted by Joseph D. Smith



***Earth Odyssey*, Mark Hertsgaard. Broadway Books, New York. 372 pages, paper \$14.00, 1999, ISBN 0-76790-059-6.**

Earth Odyssey is a vivid narrative about one man's journey around the world in search of the answer to one of the most pressing questions of our time: Is the future of the human species at risk? In 1991, Mark Hertsgaard, the author of *Earth Odyssey*, decided to act on his concern and investigate this escalating crisis for himself. Traveling on his own dime, he embarked on a journey that would last more than six years and take him to nineteen countries. In this journey he compiles an incredible collection of first-hand stories from people who live daily with environmental degradation.

The environmental issues presented in *Earth Odyssey* are as diverse as the people Mark Hertsgaard meets in his travels. As Hertsgaard makes his way back and forth across the globe from one environmental hot spot to the next, he is revealing the stories of environmental degradation and the human condition.

Hertsgaard is not dealing with only one aspect of environmental degradation or one geographic site. He is attempting to present a global picture of how humans as a species have impacted and continue to impact the

natural environment. He explores what the long-term affects of unbridled economic and technological growth will mean to our future and the environment. One of the questions he poses in this book is, "can the world continue to feed an exploding population and how can we equitably share the limited natural resources and arrest the current trend of environmental devastation?" These and many more are the issues Hertsgaard presents to us, and he does this in a compelling way.

He addressed the issue of farmland degradation in almost every country he visits. The challenges that farmers in these countries are facing are different than those faced in the United States. Along with the destruction of land from development, many countries destroy farmland at a much faster rate than in the U.S. Salinization, high nitrate levels, chemical pollution, acid rain, and groundwater pollution are all effects of urbanization on agricultural land in developing countries. For example, in rural areas surrounding many Chinese cities, people cannot grow crops due to the fact that over 60% of their annual rainfall is acid rain.

Along with these realizations of the irreversible damage that is occurring in these countries he begins to make a connection between them and what is happening in the US. Over population, decreasing biodiversity and the consumption of farmland leads Hertsgaard to ponder the future stability these issues have on the worlds' food supply.

Hertsgaard introduces us to the individuals he meets on his travels, people who are most in touch with and affected by the natural environment. He describes the appalling living conditions and hardships of the poor in the third world, and by giving them a human face with which we can identify, helps us understand why their struggle for daily survival is more important to them than the environment. We begin to realize it is not sufficient to say "save the Amazon" without saving the people whose lives depend on clearing the jungle in order to sow

the seed that will hopefully provide food to sustain their family. We can not demand the Chinese stop burning coal for warmth when we realize that the inside walls of their homes are white with ice in winter. In a well-to-do capitalistic society, we can no longer continue to point the finger at the third world when the pollution created per capita by those of us in the wealthy nations far exceeds that of the poor. Hertsgaard has shown this, and through his conversations with the people he meets on his travels, enables us to see the world through other eyes.

Submitted by Steven Zimmer



Putting Theory into Action:

Semester Project Reports

Some progressive educators and enthusiasts about participatory education maintain that there is a larger gap between knowledge and action than between ignorance and knowledge. Their claim that we know much more than we are able to put into practical application supports the observation that everyone comes to the learning environment with a special set of experiences, and that anything new should build on the context carried by each learner. This is the principle behind such innovative educational approaches as Montessori schools for young children, total immersion and action in language study, and "just-in-time education" that is fostered by the Nordic educational network in agroecology.

In the Urbanization course we assigned a semester project of each student's choice to be pursued throughout the four-month time frame available. The objective was to take information and methods from a number of guest speakers, class exercises and discussions, and relevant reading materials and put these into practice in solving a real world challenge. Project oral presentations were shared with the class during the last two class meetings, and a written document was due on the last day of the semester.

There was an interesting range of topics in the semester projects, from impacts of urbanization on deer populations and their behavior, to the impacts of bluegrass monoculture in home lawns and the implications of more diverse alternatives. One of the most applicable to the goals of the class (Jered Morris' project) included an analysis of the economic costs and benefits of alternative strategies available to a family with a 160-acre parcel just southeast of Lincoln and in the path of development. The alternatives of continued farming, of keeping the land and doing their own subdividing and sales, or of selling the land to a developer were analyzed both quantitatively in economic terms and more qualitatively in human terms. This project provides an excellent local case study for future years.

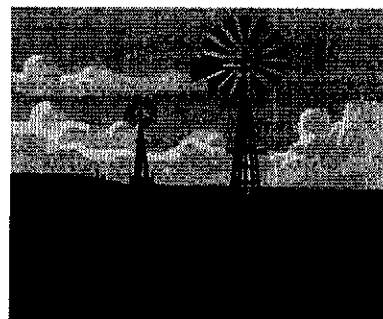
One lesson learned was the procedure necessary for conducting surveys on land use decisions and the complexity of moving the process through the Institutional Review Board. We found that class exercises did not need to follow these steps if they were not headed for eventual publication. Thus, two of the studies conducted by students are not included here. There is one (James Newman's project) that was submitted to the board and approved by the process for publication.

In general, the projects represent rich learning experiences for all class participants; both students and faculty alike. The cases are presented here with only minimal editing for grammar and correctness of expression. The ideas are not challenged nor modified, thus the reports represent the work of the students in the class.

With the difficult budget situation at University of Nebraska, one that is characteristic of most universities today, we find it nearly impossible to schedule very many field trips, study tours, or other out-of-classroom learning experiences. On the one hand, costs of van rental and supplementary insurance increase costs for a course beyond what is available to instructors – they are forced to borrow funds from other budgets such as research or to pay the costs personally. At the same time, student schedules are so busy that it is difficult to schedule activities outside the normally assigned class meeting times. Independent study projects such as this course requirement provides one option where the work can be carried out on the student's own time schedule.

Some of the projects are related to people's jobs or to a unique prior experience where they already had data or strong background. This type of efficiency in "stacking" activities might be called "double dipping" or rehashing old ideas into a new format. Another interpretation is that students build on positive prior experiences and pursue a topic of great personal interest in greater depth, thus enriching their learning, and pushing a subject into a new context or with newly available study methods and background information. In any case, we strongly encouraged students to pursue a topic of great personal interest, knowing that they would become more involved with something that was important to them.

In this complex educational milieu we are resolved to continue to find ways for students to enrich their conventional classroom experience. Providing options of individual or group projects, assigning topics or providing a list from which to choose, giving a maximum of flexibility in choice of methods and reporting, and giving room for personal expression are all potential methods to make this a rich learning experience. As we continue to experiment with different models, we will hopefully enlarge our repertoire of available options for students to pursue in an open learning environment. As instructors, we must continue to grow to help students meet the increasingly complex challenges that will characterize their futures. We owe them no less – and the semester projects are one important component in learning about the *Urbanization of Rural Landscapes*.





A Case Study of the Whitetail Deer Management Program at Fontenelle Forest: Bellevue, Nebraska.

John Albert

Wildlife changes are inevitable when land use changes. Some types of wildlife move or are eliminated from developed areas while others thrive. One of the survivors is our native whitetail deer, which are experiencing a population boom in this country and also in Nebraska. Much of the increase is adjacent to or within newly developed urban areas.

Several reasons explain high deer numbers in these areas. Deer numbers have been increasing since the turn of the century, when their numbers were down to a few hundred animals within the state. The carrying capacity of urbanized farmland is very high, meaning food sources and escape cover are abundant. The reproductive rate of whitetailed deer is also high. Most does have twins.¹ Whitetailed deer have a natural tendency to hide rather than run away from danger. Finally, urban deer habitat is the best deer habitat available. Deer are ruminants, meaning they can eat foods high in cellulose. There are very few plants that cannot be consumed by deer. Urban habitat consists of many different parcels of land that provide escape cover, many food sources and relatively low disturbance. Whitetailed deer's tendency to hide rather than run makes them very tolerant of humans living in close proximity to their environment.

With the exception of automobiles, little to no deer predation exists in urbanized areas.

So, the question is, what to do with the deer when the populations get very high?

A General Overview of Control Methods

Capture and Relocation

If deer numbers are small and habitat limited, it is possible to trap and relocate deer to other areas. Live trapping, rather than darting with tranquilizers, is the preferred method. Tranquilizing deer is very difficult, as most dart guns have very limited range. It is hard to approach close enough to an alerted deer, so it is best to use some type of bait/trap combination. Traps are somewhat more effective, as they do not require constant attention. However, the labor required to prepare and bait traps, check them frequently, and transport deer to release areas is very time intensive. A high percentage of deer are trap resistant due to high natural wariness. Trapping and relocation costs are very high, averaging 300-600 dollars per animal relocated.² The areas that will accept trapped deer are few, as most locations have about as many as they will tolerate already. If the survival of the animals matters to the property owner, they will not be comforted by the survival rate of relocated deer. Sixty to ninety percent of relocated deer die within six months of relocation.

Whitetail deer are a very territorial species, living their life in an area they become thoroughly familiar with as they mature. Relocation may cause them to enter the territory of indigenous deer,

which resent intrusions in their home areas. Relocated deer are not familiar with the new landscape, leaving them vulnerable to accidents, disease and predation.

Sterilization and Contraception

To avoid the survival problems associated with relocation, some groups have tried sterilization of deer, or the use of contraceptives. Administering contraceptives is difficult. Contraceptives have limited time effectiveness and require that the same deer be captured or darted repeatedly, with high recurring cost per deer to maintain effectiveness.

Sterilization may be the most costly method of all to administer, since it requires a surgical operation on each deer.³ Exposure to human contact for long periods of time places high stress upon captured deer, with a small percentage dying from shock or stress. Studies have shown sterilizing males tends to kill them. The buck, of course, has no idea that he is sterile and attempts to breed repeatedly. Since the does do not become pregnant, they cycle repeatedly. Bucks eat very little food during the rut. The bucks will still be pursuing does when they should be eating to regain bodyweight and condition to survive the winter. Thus bucks are weakened, and cold temperatures and winter storms may be fatal.

Fencing

Fencing is a passive, non-lethal method that requires high barriers to be effective. Deer can leap to amazing heights. Seven feet is a minimum height for a deer fence, with eight feet being much more effective.⁴ Deer can, but rarely will, leap over eight foot fences.

Installation costs are high. Finally, the fence may be effective at keeping deer out of individual yards, but it does not address deer populations outside or within the fenced areas. It is very difficult to remove all deer from an enclosed area once they are there, or keep them out if they want to get in.

Lethal Methods; Professional Control and Managed Hunting

Lethal methods of control take two forms; baiting and shooting by a professional marksman, or managed hunting.

Professional Control

Professional control offers an opportunity to remove large numbers of deer in a very short time. Property intrusion by the shooter is minimal, and most controlled shooting is carried out at night to minimize landowner disturbance and public conflict. Politics and public opinion may be against shooting, and city zoning laws may prohibit the discharge of firearms. In special cases, zoning laws are changed or waived to make shooting possible. Shooting may not appeal to local landowners, who may campaign against lethal methods. The potential for accidents may exist, but most professionals have a high level of competence and damages are very rare. Professional shooters do not work for low prices. Since they must obtain permits, work odd hours, exhibit a high level of competence, provide their own insurance, and remove the dead deer, the cost per deer removed can be high, ranging from 200 to 400 dollars per deer.⁵ The fact that the shooter may carry his own insurance does not prevent the sponsoring landowner from responsibility for any damages that may

occur, usually necessitating insurance for them as well.

Managed Hunting

The final option available for deer population control is a managed hunt. This is the method used by Fontenelle Forest in Bellevue, Nebraska. This is a case study of their experiences.

Fontenelle Forest

Fontenelle Forest is a privately owned nature preserve open to the public throughout the year. Just off Highway 75 and the Kennedy freeway, it is bordered on the north, west and south by the city of Bellevue. To the east is the Gifford Farm and the Gifford Wildlife Management Area, which are bordered by the Missouri river.

The city of Bellevue started to approach the boundaries of Fontenelle Forest in the seventies. By the early eighties the forest area was enclosed by the city. The terrain of the forest upland is typical of the loess bluffs adjoining the Missouri river-steep, eroded hillsides with deep ravines. Adjacent houses are built on the hilltops, while the ravines remain wooded. To the east, at the base of the bluffs, a railroad line bisects the forest. The west side of the forest is divided into north and south uplands by the road leading to the visitor center. To the east of the tracks lie the forest floodplain, Gifford Farm and the WMA.

Deer started to populate the forest and Gifford WMA in the 1950's. The number of deer in the area increased to the point that a hunting season for deer at Gifford WMA was started in the mid 1960's. Fontenelle Forest remained closed to any type of hunting.

By the late 1980's the understory vegetation in the park was showing very heavy defoliation. Since a drought was

occurring at the same time, it was thought that the sparse vegetation would recover when the rains returned. By the early 1990's the drought was over, yet the forest vegetation had not recovered.⁶

A census of the forest's deer population was undertaken by aerial observation in the winter of 1991, and has occurred every year since. The survey of the park showed that 500 to 700 deer occupied the two square miles of Fontenelle Forest.⁷ Carrying capacity given excellent habitat and natural food sources in the park is more like 30-60 deer.

Despite the very high deer population and the very noticeable defoliation of the forest understory, the deer remained in good shape, with no evidence of starvation. It was noted that a number of landowners adjacent to the forest were feeding the deer. One group of landowners had hired a service to dump molasses coated shelled corn in a number of feed bunkers on the borders of the forest.

However, the complaints also started coming in about the condition of the forest. The number of landowner complaints about deer numbers also started to increase. The forest managers wanted a typical forest environment with healthy vegetation. The understory vegetation was changing to plant species avoided by deer, which were primarily weeds and stinging nettles. The situation was puzzling. Deer hunting was allowed on adjacent Gifford WMA and had been since the 1960's. Why hadn't the deer numbers been kept in check by the hunting adjacent to the forest?⁸

Management Changes and Consensus

Seeking answers, Gary Garabrandt, Park Ranger at Fontenelle

Forest, attended a seminar on deer population management held in Kansas City in 1993. The seminar included a broad range of private and public landowners, wildlife professionals, and animal protection groups. Different approaches to reduce deer population damage were presented.

Upon returning from the seminar, Gary and the managers of Fontenelle Forest created a task force to research the problem and obtain consensus from the variety of interests centered in and around Fontenelle Forest. The task force included the Forest, the City of Bellevue, Bellevue police, the adjoining Scout and YMCA camps, the Bellevue city council, the Union Pacific railroad, Army Corps of Engineers and Offutt Air Force Base, as well as the adjoining landowners to the forest.

This task force commissioned a study on the deer and their movement through the forest. Answers were sought as to the reasons why hunting on the adjacent WMA had not affected deer populations in the forest. The study was the graduate work of Kurt C. VerCauteren, student at the University of Nebraska-Lincoln, and cost approximately ninety thousand dollars to complete.⁹ The task force picked up half the tab, with the remainder coming from federal grants on wildlife research.

Deer were trapped and fitted with collars that traced their movement through the forest. A total of 52 does and 4 bucks were tagged and released, and their movement studied for four years. The information obtained was very surprising, even to the rangers of the forest. Deer, especially whitetail does, have a very limited home area, refusing to travel more than 150-200 yards from their core or "home" areas. Deer in the uplands never traveled outside the area

and never ventured out into the floodplain.¹⁰ The area that a deer occupies as it ages does not change and is surprisingly small.

After studying the results of the research, it was determined that lethal means were needed to control the deer population at Fontenelle. Relocation and trapping were not possible because there was no place to transport the deer. Sterilization and contraception could not deal with large deer numbers. All were far too expensive. The problem with professional shooting was sustainability. A shooter might move in and reduce the deer population to manageable levels in, at most, a few months. However, once the shooter left, the remaining deer would be left to repopulate and the problem might reoccur in several years. Given that a healthy deer population is capable of increasing 30 percent every two years, methods to keep the deer population under control had to be maintained every year to keep the deer population at the desired level.¹¹

A yearly managed hunt was the task force solution to the deer problem at Fontenelle Forest, since it offered the sustainability needed to keep deer numbers under control. Organization and administration of the hunt proved to be a big task for the rangers at Fontenelle Forest, and many issues had to be addressed before the hunt became a reality.

A number of public meetings were held on the topic of the hunt, which was well attended by landowners and other interests. Gary Garabrandt characterized the landowner reaction to the idea of a hunt as "75 percent for it, 15 percent with no opinion, and ten percent somewhat to highly opposed to the idea."

Somewhat surprisingly, a former employee of Fontenelle Forest led the opposition to the deer hunt. Gary characterized the opposition as a small, vocal group with no overt backing from animal protection groups. When asked for their solution to the problem, protectionists suggested "letting nature take its course." The protectionists also included the landowners who were feeding the deer. Gary, somewhat laconically, commented that "the protectionist would rather let them starve and overpopulate to the point that the forest would be ruined. Their solution, essentially, was no solution at all to the interests that managed the forest."

Management of the Hunt

The forest does not lie within the city limits of Bellevue, so the discharge of firearms on forest grounds was legally permissible. The proximity of adjoining houses was of great concern to the management of the hunt, and many steps were taken to minimize the chance of accidents. The entire park is closed during the hunt, which takes place during the first week of December and lasts for nine days. All points of entry to the forest are guarded and blocked 24 hours per day during the hunt, with park employees manning the barricades. Some park visitors, having driven across town to visit the forest, become upset when they learn that the park is closed. Gary is resigned to explaining "the reason why" to a number of would-be visitors every year. He comments that "some people just don't read the newsletters we send out, or see the public notices that we post every year. You just can't inform everyone if they don't want to be informed."

Weapons used for the hunt are either bows or muzzleloading rifles. The

archers are positioned in the upland areas, adjacent to the houses. Muzzleloading rifle users are located in the floodplain at a greater distance from homes, where terrain and distance mask the sounds of their shot from landowners living next to the park.

The hunt is very rigidly controlled. All hunters must apply for their permits through the Nebraska Game and Parks commission, with license fees that are the same as that for deer hunting in the rest of the state. An access fee of 15 dollars is charged to each hunter to help pay for the costs of administering the hunt. A limited number of hunters are allowed on the forest, with approximately 120 selected individuals participating in the hunt. Not all hunters are present at one time, due to individual time constraints and hunter density requirements of the forest. Gary commented that "this isn't a kiddie hunt. No hunters under 21 year of age are allowed." All hunters are required to have passed the normal hunter safety courses, but the forest also has its own requirements.

Each hunter is required to attend and pass a safety and hunting course administered by Game and Parks personnel and Fontenelle Forest rangers. Specific courses are offered in either bowhunting or firearm areas. The courses are intended to familiarize the hunters with the boundaries and restrictions to hunting in Fontenelle Forest and specific safety issues. All hunters, either bow or gun, are required to pass a marksmanship test before being allowed on forest grounds. In addition, all hunting is to be done from elevated treestands in the forest. In this way the projectile is directed at the ground, with greatly reduced chances of a stray shot traveling outside forest boundaries.

Hunters, upon arriving at Fontenelle Forest, are required to check in and note which specific treestand they will be hunting in. Gary requires that each hunter have a specific area to hunt, and does not allow changing of location unless prior approval is granted and adjoining hunters notified of the move. Actual time spent hunting is also recorded for each hunter. Movement through the forest is limited to paths that lead directly to the deerstand. Any violation of forest rules and requirements will result in the removal of the offending individual, who will be asked not to return. No incidents have occurred that have required the taking of these steps.

Commenting on hunter demographics, Gary noted that the muzzleloading hunters tend to be older, and return to the forest year after year to hunt. Bowhunters tend to be younger, with a higher turnover rate. The majority of bowhunters are airmen and other personnel from Offut Air Force Base. Bowhunters using the forest have a 56 percent success rate; that for muzzleloading hunters is 92 percent, averaged over the course of seven years of hunting at Fontenelle Forest. However, the biggest single predator of Fontenelle Forest deer are the trains that run on the Union Pacific railroad line at the base of the upland area. The task force study conducted by the graduate student noted three to four dozen deer were killed by trains every year.¹²

The hunt specifically targets does, as they produce the highest reduction of numbers per animal. Each doe represents the potential for two additional deer after the breeding season, which occurs just prior to, or during, the hunt in most average years. More specifically, the hunt allows the taking

of "antlerless deer", which for the purpose of identification could be either does or young bucks without antlers, often called "button bucks." The deer numbers thus taken average two thirds does, one third bucks. This is in direct contrast to the hunting allowed on Gifford WMA, where permits are issued to take two thirds bucks, one third does. Commenting on the difference, Gary notes that "Fontenelle Forest is looking to reduce deer numbers; Gifford WMA is managing for population stability and a huntable number of large antlered deer. Very different management criteria."

The number of deer taken at Fontenelle averages 80 to 85 per year. Gary figures this is about optimum given the hunter numbers and relatively short season allowed.

Recovery of the Forest

Recovery of the native vegetation has occurred in some areas, but is slow to appear in others. Gary links this to topographical features. "The north upland is recovering fairly well. It is more evenly distributed with deer, and hunter access is easier to achieve due to roads and spacing of the houses. The floodplain is recovering very well, and this is attributable to the high number of muzzleloader hunters located there with a higher success rate than the archers. The south upland, however, has a number of ravines that lead off of the forest property, which provide escape routes for deer where the hunters cannot travel."

To address some of the population issues, Gary has experimented for the first time with allowing firearm hunters access to the south upland. Fifteen more deer were taken in the south upland this year as compared to previous years. Due to the

success of this change, Gary may keep this access available in coming years to keep deer numbers under control. Special notification and education of adjacent landowners was undertaken to minimize conflicts with firearm hunters in the south upland. Nebraska Game and Parks requires that firearm hunters stay at least 200 yards from occupied dwellings while hunting, and Fontenelle Forest followed these restrictive rules when positioning firearm hunters in the upland.

Gary foresees the hunt continuing to take the same number of deer every year for several more years. "Every year we evaluate the population with an aerial census to determine the effect of the hunt and where we need to go with management to achieve our goals. When deer numbers start to maintain a better equilibrium with the carrying capacity of the forest, we will reduce the number of deer taken to maintain a consistent population."

Costs, Legal issues and Potential Problems

When asked about the cost of the management program, Gary stated that it was difficult to give an exact dollar figure per deer taken.¹³ "We charge an access fee to defray some of the cost of the hunt, and that's a plus. The hunter removes the deer himself, so there isn't a disposal problem. The first year we had the hunt, I spent about 50 percent of my time on hunt related issues, from administration and paperwork to actually being on the grounds while the hunt was conducted. Now the hunt and related issues occupy about ten percent of my time every year, and since we have some experience with it, things are running pretty smoothly. I have a good base of

experienced hunters returning every year, and that certainly helps."

Insurance is a necessity to protect the Forest, its hunters and nonhunting visitors, and adjoining landowners. Gary stated that "On average, insurance costs amount to 32 dollars on every deer taken, but there's really no way around that. Legal advice suggested that by conducting the hunt, Fontenelle Forest assumes liability for the actions conducted within its boundaries. I know of no hunt where insurance is not required to cover any accidents."

The adjoining landowners have mostly accepted the hunt and how it is conducted. When pressed for numbers, Gary said, "I suppose the acceptance is about the same or slightly better than the numbers existing before the hunt-that is, about 80 percent of the adjoining landowners support the hunt, about 15 percent don't care one way or the other, and five percent are still against it." The opposition mostly stems from those objecting to the idea of a hunt for any reason. Gary has noted that a very few witnessed hunters dragging deer off forest boundaries to their vehicles and were disturbed by the sight. "I don't know what to do about that," Gary said. "Life and death exists everywhere, and we've tried to minimize the impact as much as we can."

I asked Gary how the costs of the hunt compared to professional hunting fees and nonlethal methods of control. Gary waved off any chance of success with nonlethal control methods. "They have no credibility, as far as we're concerned. Their central premise is not killing the deer for any reason, but actual realities mean that control just isn't going to happen. Trapped deer die shortly after they're relocated and trapping costs too much. Sterilization?

Who is going to sterilize hundreds of deer? Costs are again too high. I know of a fellow that has a 60 acre enclosure on a military base. They tried darting the deer. It's relatively easy to get the first deer darted. You'll spend all day trying to get a shot at a second deer. They tried running the deer out of the enclosure by making an opening in the fence and herding the deer toward the opening. First off, it's impossible to drive deer anywhere. They go wherever they want, and often try to run around the people driving them. They managed to run a few deer out, which were later observed trying to jump over the fence and get back in. A number of them made it."

"Professional hunting has no sustainability. Iowa City had a deer problem in one of their parks and hired a professional shooter to reduce the herd. A legal hunt could not be held because the park was within city limits. They paid about 70,000 dollars to shoot the deer, but in six or seven years they'll have to do it all over again."

I asked Gary that since he had the benefit of hindsight, what he would change about how the deer problem was resolved, and any future problems he might foresee. "I don't think I'd change much, if anything. I might apply for a depredation permit if the last few deer we need to remove proved difficult to get in certain areas like the south upland, but I don't think that will be a problem. Muzzleloader hunters should be able to bring deer numbers down even in that area. The hunt has gone well for us. It's a pretty busy time of the year, but the hunt is actually fun to administer, and the group of hunters I have are a good bunch." Please note that a depredation permit allows the landowner to use methods to control deer similar to how a

professional shooter operates-by using a spotlight at night, and possibly baiting the deer as well. It is issued only to landowners suffering property or crop damage from wildlife.¹⁴

The Omaha World Herald reported that a hunter shot another hunter in a bowhunting accident during the 2002 hunting season near Fontenelle Forest. I asked Gary if it had occurred on forest property. He replied, "No, it did not. It happened on the Gifford Wildlife Management Area. It was the usual dumb actions of an individual who had no business behaving as he did. Alcohol was involved, and he shot at a sound in dim light. The man that he shot was pierced by an arrow that went through both his legs. He will be crippled for life." Commenting further, he said, "When the case went to court, it could not absolutely be proven that the shooter was guilty of criminal negligence. Found innocent by the court, he then went on to sue the Game and Parks Commission!" When asked why the man guilty of extreme carelessness was suing the Game and Parks for his own actions, Gary said that the Game and Parks charged an access fee to hunt on the WMA. "By charging a fee, the Game and Parks assumes some liability for the actions of the individuals using the property. The case is still pending."

Gary noted that sometimes accidents do happen, but legal counsel advised the task force that they had taken "reasonable actions to assure that the hunt was conducted in a safe manner." Beyond that there are no guarantees, so insurance coverage is mandatory.

Summation

Deer management methods vary depending upon location and ownership. Nonlethal methods of control are successful only with very small deer populations or when the landowner is willing to spend large amounts of money to reduce the deer herd. In reviewing a large number of successful case studies, very few serious control schemes other than lethal means had any credibility. Deer population control will not be cheap no matter which effective means is selected, but Fontenelle Forest's program is targeted precisely, administered carefully, and is likely to

produce the results that are needed to maintain the forest in good condition. It is modeled after successful programs presented by other wildlife management concerns, and could itself serve as an example of a good solution to an emotionally charged and politically difficult problem.

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Why?

Kyle P. Bell

It's hard to think how one little word, one little question can be the cause of so much thought, so much discussion, and so much controversy. There are those questions which have easy answers and those questions that have impossible answers. Unfortunately, I have been blessed with the need to know the impossible answers. Or at least attempt to know. Maybe its this deep down intellectual part of me or just the fact that I've always hated not knowing something that affected me. So when I began thinking of a topic to write about for my final presentation for Agronomy 489, Urbanization of Rural Lands, I had to ask myself why? Why would urbanization occur, what forces would drive this process, were these processes for the good or bad of the rural lands, and just where did I stand on the issue. Here's what I found.

Four years and 28 credit hours later I have accepted the fact that economics makes the world go round, at least in theory. From the aspects of basic agricultural production to the pricing decisions made by the major agricultural companies, economics is the key. I began with the notion that every decision made had some form of economic reasoning behind it. Whether the decision was to sell some land to pay of some debts from hard times or to sell some land to pursue more profitable ventures, economics plays a role. I have seen personally the effects of positive urbanization. In my hometown of Giltner Nebraska there was roughly 15 acres bought right on the outside of town. As I am not aware of the final per acre price paid I can assure the reader

that it was substantially high for agricultural land typically being bought in the area. The land was sold by a retired farmer who had decided he simply would invest the money earned from the sale into more profitable ventures. The land was sold to two buyers, a development company and the local co-op. In cooperation with the city board the land is going to be used to develop a second ball park for the community, a small housing development, and an extension of the co-op in terms of new office buildings and weigh station to decrease the congestion often occurring in the town during busy farming seasons. It is no doubt that almost every citizen in the small town of roughly 380 people would agree on the benefits being brought to the community by this form of urbanization. Although I have not personally witnessed negative urbanization I have been fortunate enough to live with someone who has seen the effects first hand. The situation revolves around the proposed East Beltway to be built around the eastern portion of Lincoln Nebraska. My roommate, name withheld, was adamantly against the east beltway in any way, shape, or form. I to began to agree with him as I began to see what the proposal would do. The proposed beltway would cut directly through some prime farm ground located on the eastern edge of Lincoln. Although there were three proposed beltways being considered, the least amount of farmland to be converted out of agriculture was estimated at 813.0 acres (pg 3.14 Draft Environmental Impact Statement Project No. DPU-3300(1)). Most personally

affecting my roommate, and eventually myself, was the proximity of the most favored path, EM-1, to the homestead and current home of his mother and father, estimated at less than a quarter mile east. Here is where heart and sentimental value began to add up in significant figures.

When I was fortunate enough to attain a copy of the Draft Environmental Impact Statement conducted for the proposed beltways my roommate took great interest in their findings. His conclusion took into account not only personal feelings but an understanding of growth and development. His conclusion, they got the right path. It has become apparent that the beltway was coming through one way or another and after looking at all the impacts on the various routes we have agreed that the favored EM-1 is in fact the most economical choice that can be made. This path requires the least amount of acres converted out of agricultural, the least amount of homes to be removed, and the least disturbance from noise possibly attainable from the construction of a four lane highway.

Economics by definition reduces waste and increases efficiency, but what if your not interested in efficiency and waste.

It wasn't until recently that I realized the importance of ethics in making economical decisions. This is not to say I never considered ethics or am in any way an unethical person, only I had not realized the significant value placed on ethical and economical decisions. But this has only deepened my dilemma between the right and wrong of urbanization.

I am in no way, shape, or form an expert on ethics, fact one. A business is run to make profits, fact two. I, like

many others, tend to see things slightly skewed in the direction that favors ourselves. So how can I, an economics major with a fine understanding of economic theory and practice, criticize those who make decision on issues in which I have no control over? Or do I. I am at a loss, and I feel that many of you as readers may also be at a loss at what the possible alternatives that are available as we struggle to live. How do we create a sound argument one way or another on this issue? I can't 'blame' business for wanting to do what it is supposed to do, and I can't 'blame' the farmer who sold out for the benefit of his family or community. I have poured myself into this and find myself no further than where I started. I can not appoint myself judge or juror on this matter. It's the impossible question.

Yet I feel satisfied. I have driven myself to a greater understanding of something that is impossible to understand. I have not stopped in my quest and will not stop, I know I will not find the answer but that only leads to more questions and more searching. Some have asked me why I put myself through something I know I will not achieve, the answer is I don't know.



Cluster Housing

Josh Bowers

It is impossible to defeat; Lincoln is growing and expanding outward. This may not seem like a problem. Well, it is, and it is getting bigger every day. Citizens may not notice the problems yet, but do you want Lincoln to turn into the city Omaha is, having nothing but concrete? There are many things that can be done to control urban sprawl. Cluster housing is one aspect of control. Cluster housing allows for expansion while keeping many acres in agricultural production and in natural states, green not concrete gray. But, will cluster housing work in Lincoln?

Cluster housing is the grouping together of single and/or multifamily dwelling units on to smaller than normal allowed area. The overall density of cluster housing would be the same as the housing ordinance of the town, but with the remaining land to be dedicated to open space. With the current regulations in Lincoln, this is only allowed in the outer areas, which will soon become part of Lincoln. This is allowed but current regulations are limited. Currently what developers have for cluster housing such as this on the outskirts of town is the community unit plans (C.U.P.), which are plans developed by the developer

following basic guidelines then approved by the planning commission. But that is just how many housing units per acre, where they can be put. There is no structure or set limits, which I feel would ensure cluster housing is serving its purpose properly. According to the design standards in chapter 3.35 of the city planning records, the following are the current standards:

Section 1. General Requirements

Following is the method of calculating density in a community unit plan. Standards (A) and (B) are guidelines to determine the maximum number of dwelling units for an amount of land area in a particular zoning district; however, the developer shall in no way assume that the City will grant the calculated maximum number of dwelling units. The City will also consider the character and density of the surrounding land area, the height, width, length and position of the proposed buildings, the proposed open space along the exterior limits of the C.U.P., the usefulness of the proposed open space along the exterior limits of the C.U.P., the usefulness of the proposed open space, the amount of ground covered by proposed buildings and pavement, and traffic volume and circulation.

1.1 Maximum Density

A. The maximum density of a community unit plan shall be calculated as follows:

1. If no public streets exist or are proposed within the boundaries of the community unit plan, the following densities will be used as a maximum base to determine the overall maximum number of permitted dwelling units:

- a. AG Agriculture District - 0.055 dwelling units per acre within the boundaries of the community unit plan.
 - b. AGR Agriculture Residential District - 0.27 dwelling units per acre within the boundaries of the community unit plan.
- 2. If public streets exist or are proposed within the boundaries of the community unit plan, the following procedures will be used to determine the overall maximum number of permitted dwelling units:
 - a. Step 1 Total the square footage within the boundaries of the community unit plan excluding pre-existing lakes, however, usable water bodies created by the developer and usable streambeds by people may be counted.
 - b. Step 2 Subtract the square footage of all existing and proposed dedicated street right-of-way
 - c. Step 3 Calculate the square footage of all land area within 150 feet of an existing or proposed dedicated street right of-way.
 - d. Step 4 Calculate the square footage of all land area beyond 150 feet of an existing or proposed dedicated street rightof-way. Multiply this figure by 0.9 for AG use.
 - e. Step 5 Add the result of Step 3 to the result of Step 4.
 - f. Step 6 Divide the sum of Step 5 by the minimum lot area of the district in which the community unit plan is located, using the minimum lot area requirements as follow for the respective districts: AG Result of Step 5 divided by 871,200 square feet maximum # D.U.'s
 AGR Result of Step 5 divided by 130,680 square feet maximum # D.U.'s
- B. The concentration of cluster of dwelling units shall not exceed the following density:
 - 1. AG Agriculture District - One (1) dwelling unit per acre with community sewer and water systems. However, if the individual septic tank and tile field sewer system is used it shall be constructed and installed in accordance with Chapter 24.38 of the Lincoln Municipal Code.
 - 2. AGR Agricultural Residential District - Three (3) dwelling units per acre with community sewer and water systems. However, if the individual septic tank and tile filed system is used it shall be constructed and installed in accordance with Chapter 24.38 of the Lincoln Municipal Code. The area of adjacent open space within the community unit plan may be added in computing the permitted cluster density only if:
 - a. The open space bounds the area of the cluster on one or more sides;
 - b. The open space was not used for the computation of density in another cluster
 - c. The open space is reasonably accessible by pedestrians from 75 percent of all dwelling units within the cluster
 - d. The open space is not separated from the cluster by a public street, highway, private roadway, driveway, a streambed or railroad when they act as barriers by reason of traffic volume, physical characteristics or adverse ownership pattern where easement area not acquired.

1.2 Shape, size and locations of buildings; open space buffers

The distance between a building within the community unit plan limits and adjacent development of future development beyond the community unit plan limits shall be increased as the difference in the height, width and length of the building increases in relation to the adjacent development or future development. The open space between different types of buildings within the community unit plan (single, family, duplex and multiple family) shall be increased as the differences in height, width and length, and the number of dwelling unit per building increases. Open space should be adjacent to the higher density areas. Multiple family buildings with more than two stories and the side of the building closest to parallel to the lot line of the single family lot is more than forty feet in length shall be setback at least forty feet (40') but not less than the height of the multiple family building from the lot line of the single family buildings and this open space shall be devoted only to trees, shrubs, grasses and other screening facilities and may be common open space or yard area for the multiple family building. Multiple family buildings shall be located, designed and arranged to maintain privacy for the adjacent residents and future residents. All structures and activities located near the boundary of the community unit plan shall be designed so as to be reasonably harmonious with the neighboring areas. Attached dwelling units, three or more, at the outer limits of the community unit plan should not exceed six units in a single row and 140 feet in length unless the

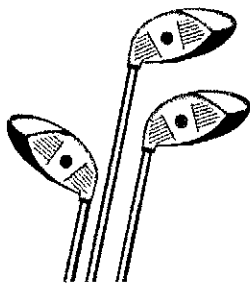
adjacent area is open space in another community unit plan or is similar in character to the proposal.

These regulations allow for the specified number of houses, but what is going to be one to make these developers want to cluster houses in one area and lose the money they could receive if larger lots were allowed?. It would be evident that if they developed this green space land it would be more profitable. So, how is this going to work? Most cluster housing developments either allow residents to own the green space or the developer may remain in control. So, either the residents are going to pay more for their property or land owners will need to be compensated in other ways. Some possibilities would be to have tax cuts for the residents of the development and not taxing the green space area. This would give the residents and developers a break for leaving the land in its natural state. One problem with this would be that as the city grows, more taxes are going to be needed so it may be difficult to get the property tax free. Another incentive to homeowners to live here would be to have extra benefits, like highly efficient homes, alternative energy sources, and/or the possibilities of making a profit of the land left natural. Another possibility would be a deduction in hook-up fees for clustering homes. With these possibilities it may be more likely to get residents to live here.

There are the basic floor plans for a cluster housing development with large green space, but the interior is up for grabs. In Lincoln they are currently working on this part of the plan. These are

also concerns that other similar developments have faced, such as Prairie Crossing in the Chicago suburbs. Many concerns are what amenities will be allowed in a development like this, so it is desirable while conserving nature. With this it is generally up to the residents, but there are many things to consider; lot size, will children be allowed, should it be an elderly community, and should pets be allowed? Many residents like fences, pools, and sheds for their yards. Would these be allowed? Other concerns include how many direct access routes would be allowed. Which homes would be allowed to have the best view or have the land near the water? Another concern would be if utilities would be allowed above ground. All of these are valid concerns for a development and its potential residents.

As the city of Lincoln keeps growing, cluster developments may be one important aspect of keeping as much of the land natural as possible rather than turning it into asphalt. As we get closer to having this type of development, I feel it is important to address many of these concerns and learn from other cities that have similar developments. It is going to be here sooner than we think.



Golf Courses and Housing Developments: A Symbiotic Relationship?

Joel Clements

It is apparent that the game of golf over the last 15 years has grown by leaps and bounds. In fact, the surge in the popularity of golf over the last decade has been record breaking for the industry. The explosive growth in golf courses across the United States and elsewhere has given assurance to this claim. Pinpointing the exact reasons for this increase may be difficult, however. What may have caused some of the growth could be the number of exceptional young golfers who have revived an overwhelmingly large population of "sleeping" golfers to either take up the game or become interested in a game they gave up years ago. Notably, Tiger Woods has sparked an interest in the game that has not gone unnoticed. Since his first major victory at the 1997 Masters Tournament, golf courses have seen a formation of a bubble in the popularity of golf, which caused a rise in the amount of total rounds they experienced. Whatever the reasons may be, the truth remains that the popularity of golf has grown.

While the number of golfers rose significantly during the 1990's, so did the number of available golf holes. By the early to mid 1990's analysts were touting the fact that the demand for golf holes outstripped the supply. A decade ago, the National Golf Foundation estimated the industry would need to build at least 350 golf courses per year to meet rising demand. (Schiffman, 2002) This led to a large movement in the design, development, and building of

courses throughout the United States. During this time, golf courses were able

to charge prices that adequately covered their costs while also earning them a reasonable return. Even with large upfront capital costs in developing and building the courses, the high prices that they charged for the numerous rounds played were enough to service any debt they may have incurred.

But, as the old saying goes, "all good things must come to an end." Since the most recent bubble in golf, evidence has shown that the demand for golf is decreasing. Yet, the number of golf courses still continues to rise, although at a slower rate than previously experienced. In fact, according to new statistics by the National Golf Foundation, 344 new courses are under construction, 395 are in planning, and 349 have been proposed. These numbers are off even from a couple of years ago when there were 1,049 courses in planning stages, 707 course under construction and 524 new courses completed in 2000. Some of the newest golf courses have found success, while others have not been able to withstand the recent decline in popularity. The profile of the average golfer is a 40-year old white male who earns \$71,600 per year. The problem with this is that there are only so many of these individuals. Obviously the supply and demand of golf courses in certain parts of the country are not in equilibrium.

Lincoln, Nebraska has been a great example of the recent trends in the

demand for golf. In September 1991, golfers in Lincoln and surrounding areas had 216 available golf holes in and around Lincoln. This figure includes both private and public golf courses. As of August 2002, the same areas boasted nearly 351 golf holes available for play. The previous and most recent census numbers for Lincoln revealed a 17.5% growth in population compared to the 62.5% growth in the amount of golf holes for the same amount of time, lagged two years. Lincoln Municipal Golf even capitalized on the boom. In September 1993 they opened their fifth municipal course, The Highlands. Even by this time, however, Lincoln may have started to show signs that the large growth in golfers was not able to keep up with the rapid growth in the amount of available holes. Exhibit A shows the number of golf rounds played on the four 18-hole municipal facilities in Lincoln. They topped out with the highest amount of rounds in July 1994 with slightly more than 40,000. Since that month they have yet to see levels as high.

Even after the opening of The Highlands, several other courses have been built. Some of these include Crooked Creek, Wilderness Ridge, and Yankee Hill among others. Can all of these courses compete for a certain number of golfers while continuing to cover operating costs, debt, and still earn a return? Apparently, they have been able to meet the first two criteria. However, if we take a look at what most of the recent courses have in common, the answer to financial security may become apparent. Many of the newest golf courses have housing developments built in and around them. Due to the large capital costs associated with planning, building, and operating golf

courses in the first years, many courses have turned to generating capital early in the project by developing the areas around the golf course. This could be the answer to eliminating the high capital costs in developing the golf courses and, consequently, allowing for better chances of financial success. According to recent statistics by the National Golf Foundation, a study of 18-hole course opening in the U. S. between 1993 and 2002 shows that in 1993, of 262.5 total openings, 14 percent were municipal, 32 percent were real-estate developed, and 54 percent were other types of course, such as private clubs, resort courses, or executive courses. The number of openings in 2002 decreased to 220, and only 7 percent were municipal, compared to 35 percent real estate developed and 58 percent other. (Luder, 2003) We will use Lincoln, Nebraska as an example to examine this trend.

The premium prices that developers are able to charge for these lots helps the course investors cover the cost of building and in turn the housing developers are able to charge a premium price to the final consumer because the demand for housing along or around golf courses is high in the marketplace. By selling housing lots around the course at premium prices, developers of the golf courses are able to make the investment become feasible. Many developers knew they would lose money on fancy courses, but they more than recovered their golf losses by charging premium prices on adjacent houses. Once all the houses sold, developers often sold their courses to management companies, at 50 to 70 cents on the dollar. According to an article in the April 11 edition of Golfweek's SuperintendentNews, the idea behind developing golf courses is to make money on the housing

developments, while at the same time subsidizing the investment costs of the golf course. An excerpt from the article is below:

- The Urban Land Institute conference was titled: Developing Golf Courses and Communities.” But it was clear by much of the event’s programs and roundtable discussions that the main topic was the industry’s oversupply of courses and static demand in participation.
- In the opening session of the conference – “To Build or Not to Build: Does Your Community Need a Golf Course” – several hundred attendees got a glimpse of the strategic mindset of five of the country’s leading golf course real estate developers. The main message from the developers, who collectively have nearly 100 courses open or in development: Developers will continue to build these “lost leaders” as long as it helps generate premiums on home sites.
- “If you’re making \$150 million on lot premiums, it’s easy to lose \$20 million (on a failed golf course),” said Randall bone, executive vice president of Las Vegas based Sunrise Colony Co.

In Lincoln and surrounding areas, the most recently built golf courses have all had housing developments associated with them. These include Wilderness Ridge in Lincoln, Iron Horse in Ashland, and recently Crooked Creek has built housing on their property. Since the financial records for these courses cannot be obtained, we will not know for sure the specifics of motivation for including housing as part of their plans. However, if the trends in Lincoln are similar to those occurring throughout the nation, the reasoning for housing may be the same.

One of the most recent proposals for the Lincoln community involving a golf course and large housing development has had its own problems even making advancements in the planning process. Nebraska National, as it has been proposed, would include a 27-hole championship golf course with additional housing lots available for purchase. This project would be part of the Nebraska Alumni Association and would have been the home course for both UNL’s men’s and women’s golf teams. However, this project has been stalled due probably to the weakening of the economy and the current situation in the golf industry.

Further supporting the idea that golf courses have high up-front capital costs is the example of The Highlands, Lincoln’s newest public course. According to a paper recently submitted in a graduate marketing class analyzing the golf industry in Lincoln, The Highlands has not turned a profit since its opening in September of 1993. Further quoting this paper, the Pioneers and Holmes courses demonstrated the

most consistent performance throughout the 1990's. The Jim Ager Junior course has showed a consistent loss over the years due to its lower amount of total rounds played.

The future of the golf course industry is uncertain. There are too many factors that could play a significant role in determining the success of current courses and the future demand for new courses in cities such as Lincoln. The National Golf Foundation recommends that as long as course builders design their courses to target a specific market, an 18-hole golf facility can be supported by a community of approximately 15,000 to 18,000 people. On the other hand, The National Recreation and Park Association

recommends a community of 50,000 people would be able to support an 18-hole facility. The differences in standards are significant.

In the meantime, the trend will be to build courses with amenities such as housing developments. As we have seen, the trend is in that direction and looks to stay that way as long as supply of golf holes surpass the demand for golf. The hard numbers across the nation indicate that golf is on decline and it doesn't look as though it is going to switch in the near future. At this point in time, it looks as though the relationship between golf courses and housing developments is truly symbiotic.

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The Use of Remote Sensing for Urban Growth

Nick Emanuel

Urban sprawl in the United States is a widespread concern, yet there is no consensus on how to define urban sprawl, what its effects are, and how it can be controlled. The measurement and quantification of urban sprawl over time is central to these questions. An extensive archive of historic and current data with high spatial integrity that is well suited to change applications has been provided by digital imagery collected from sensors based on satellite platforms. Remote sensing tends to orient towards any applications that are of direct and immediate benefit to people and society. Space imagery of cities and urban areas are very good starting points for making land use and land cover maps, which can then be used to map urban sprawl. This paper will look at how remote sensing can be applied to urban growth planning, by mapping out the urban changes that have rapidly occurred all across this country. [2]

Before we begin to address how remote sensing can be applied to measuring urban growth, we first must understand what remote sensing means in general. Remote sensing is the art and science involving the detection, identification, classification, delineation, and analysis of earth surface features and phenomena using imagery acquired from terrestrial, aircraft and satellite platforms equipped with photographic and non-photographic sensors using visual and computer-assisted interpretation techniques. In simpler terms, it is the process of gathering information from a distance. Next, are the devices or sensors used to collect the data. Satellites located in

space use remote sensors to collect thousands of images daily. There are many different satellites in use, with the major differences between the satellites being the number of bands they are able to detect, and the resolution of the image being collected. [5]

One of the most popular, and widely used satellites, is Landsat 7. The Landsat Program is the longest running enterprise for acquisition of imagery of the earth from space. The first Landsat satellite was launched in 1972; the most recent, Landsat 7, was launched on April 15, 1999. The instruments on the Landsat satellites have acquired millions of images. The images, archived in the United States and at Landsat receiving stations around the world, are a unique resource for global change research and applications in agriculture, geology, forestry, regional planning, education and national security. Some other major satellites in use are SPOT, IKONOS, AVHRR, and MODIS. An example of the differences is, Landsat 7 is able to collect eight bands at around thirty meter resolution. IKONOS can collect five bands, but at a much higher resolution from one to four meters. Other sensors that collect similar data are used on aircraft. These can include ADAR, or AISA, which is currently being used by CALMIT at the University of Nebraska-Lincoln. These are generally higher quality images, mainly since the sensors are collecting data at a much closer distance than from far outer space. AISA is able to collect as many as thirty-five bands at a resolution from 0.5-3 meters. [5][6]

By using this remote sensing ability one can study urban sprawl and

its economic, social, and environmental impacts on America's communities. The first successful step in defining urban sprawl is just that, defining it. It is not a trivial task, but many definitions involve the use of subjective and qualitative terms. A model must be developed to provide a quantitative and objective analysis to better understand where, how much, and what kind of development has occurred. Many criteria can define good urban sprawl, and many of the characteristics have never been implemented together before. Spatially detailed data with fine spatial grain examine the whole landscape. Therefore, this tool is broadly available to allow for regional planning. It assesses urban growth in all areas, avoids spatial averaging, maintains spatial pattern and configuration, has historical depth, and is consistent over time. Utilization of multiple dates of spatially registered Landsat data in conjunction with an objective and repeatable model provides an urban growth map that characterizes where and what type of growth has occurred over time. [2][1]

One of the first steps in a good urban growth model is to use different dates of remote sensed maps to create a change map. There are three types of change classes that will be identified. The first type consists of no change classes, including developed, water, and interior. The second type includes improbable changes, likely due to classification error, and the third type consists of classes that represent urban growth. The change classes that represent urban growth can be broken down even further to examine the different types of urban growth. These types are infill growth, expansion growth, isolated growth, linear

branching growth, and clustered branching growth. Examples of each of the five types of growth, along with a high-resolution image for reference, are displayed in Figure 1. [1]

Using spatially detailed and widely available multi-temporal satellite imagery with a model can create a map of urban growth. Combining urban growth maps over several time periods creates an informative picture of the dynamics and changes that have occurred in an area. Local decision makers can see the results of past decisions and policies, and begin to incorporate the lessons into future land use policies. Figure 2 shows an example of multi-temporal satellite imagery collected in different years. By looking at this, planners can compare past and present changes of urban growth. [3]

Once the land cover and land use changes can be identified in specific areas, it is then important to determine what the specific land cover or land use is, that is changing. All land cover on the earth's surface reflects some type of wavelength that is detected by remote sensors. But each individual type of land cover reflects a different type of wavelength, making different curves to their waves. By identifying what land cover makes its own specific curve, we can then categorize land cover types by their reflectance curves, specifying each change in land cover or land use. These changes are then usually color coded, as shown in Figure 3. Urban planners can then examine urban growth exactly, instead of guessing where they think it is, or where they thought it was. Views of America's landscape like the one in figure 3 will not only help planners combat urbanization, but will also help community's struggle with the effects of economic growth, while protecting

natural resources and community character. [2][5]

Obviously, more concern is being made about the economic, environmental and cultural toll of forest fragmentation and urban sprawl across the United States and worldwide. However, without remote sensing, the extent and rate of these land cover changes may not be fully understood, particularly by local officials whose decisions about land use will determine the look and feel of the country's landscape for decades to come. In 1972, Las Vegas, one of the United States most famed cities, had about 270,000 residents, and by 1992 the city had grown to more than 900,000 people. Growth of the city is more evident comparing satellite imagery, like that of Landsat 7 found in Figure 4, than it would be to the naked eye. Again, this aids regional and urban planners tremendously when dealing with urban growth, and urban sprawl. [4][7]

In conclusion, community officials will need all the education, accessible data, and technical tools they can get, to enable them to get a handle on their changing landscape, and the relationship of these changes to their daily land-use decisions. With advances in remote sensing science, and in our ability to analyze temporal changes in our landscape, there is great promise for putting to rest any questions of the relevancy of remote sensing to local land-use decisions. It has been proven that time series land cover information provides information on the type of change that is occurring in the landscape at a detailed scale. This information will be beneficial to local land use decision makers to begin to better understand the ramifications of their land planning decisions. Past techniques have

measured urban change, but have failed to adequately categorize it. Remote sensing derived land cover information, however, can be an excellent data source for examining, quantifying, categorizing, and mapping urban growth. Remote sensing provides a systematic, standardized, and replicable methodology that can be used to describe the urbanization process that provides insight into changing and emerging landscapes and patterns. [1][5]

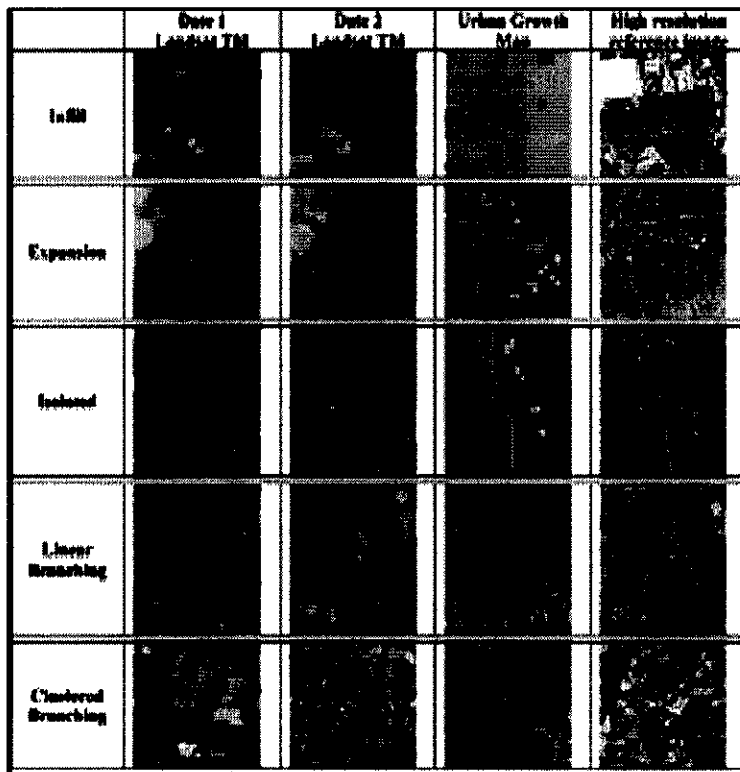


Figure 1. [1]

Figure 1. Examples of each type of urban growth are shown. Because two dates are inherently necessary for measuring urban growth, the first and second dates of the original Landsat TM (used to create LULC maps) are shown along with the urban growth map where gray is developed, green is non-developed, blue is water, purple is infill growth, magenta is expansion growth, yellow is isolated growth, red is linear branching growth and orange is clustered branching growth. A high resolution image of the same area is shown for reference and validation only. The expansion, isolated, and linear branching examples show a 1999 4-meter multispectral Ikonos image; and the infill and clustered branching examples show a 1995 digital orthophotograph where, in both cases, the development had either not yet started or not yet finished. All Landsat images were captured before 1999. [1]

Figure 2 – Yearly Changes

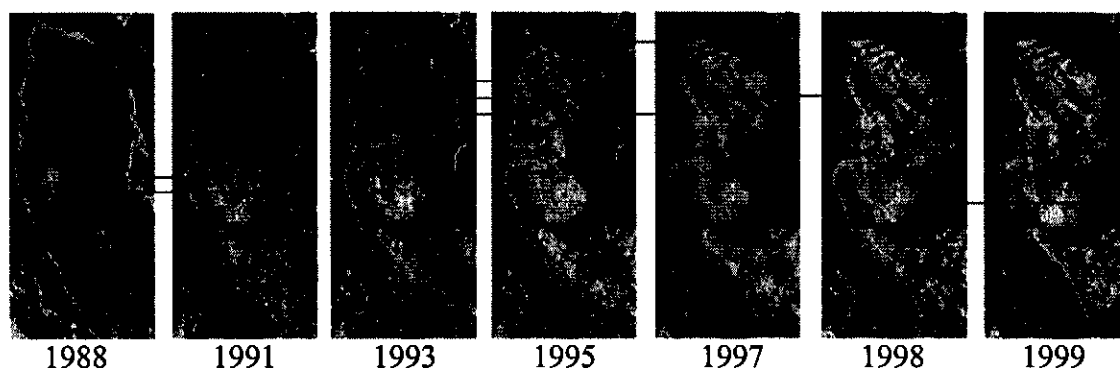


Figure 2 compares yearly changes of the Salmon River Watershed in Connecticut, from 1988 to 1999. Arrows from picture to picture examine the exact areas of land cover change. [3]
[5]

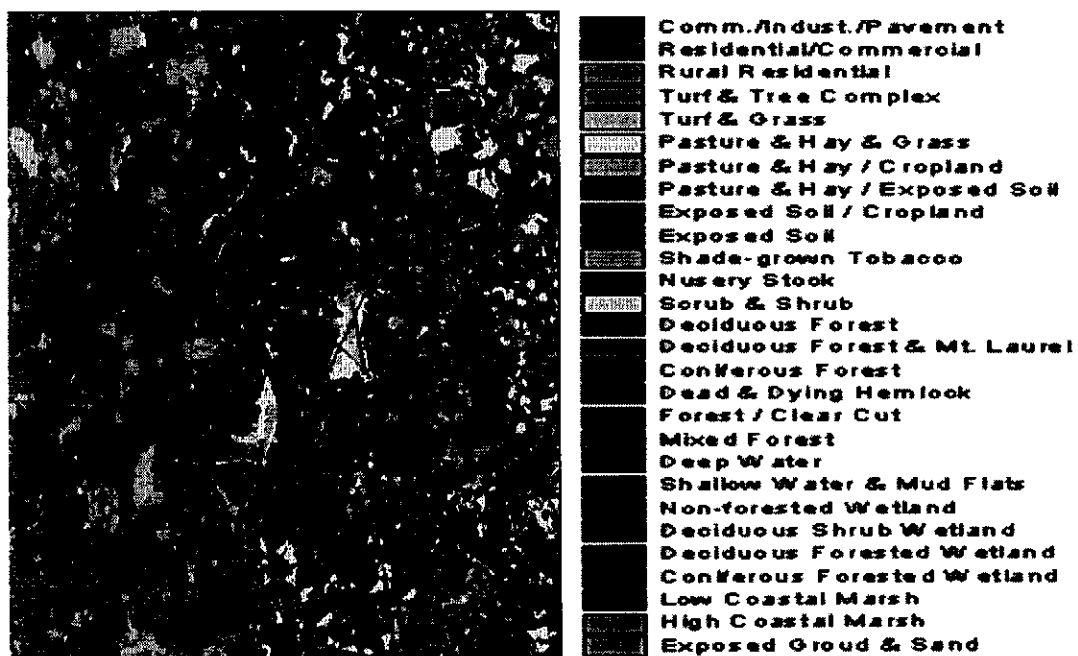


Figure 3. Land Use and Land Cover Applications. [5]

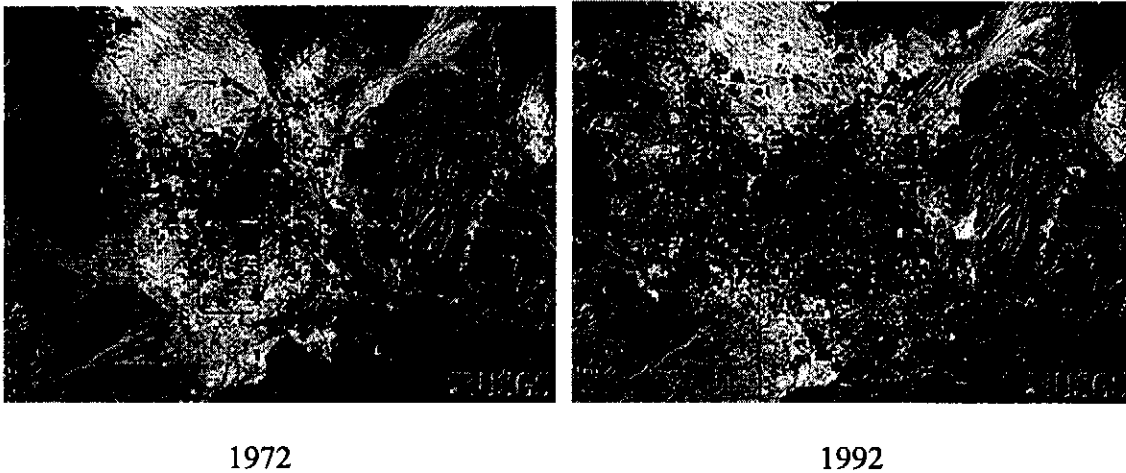


Figure 4. Landsat 7 sub scenes of Las Vegas, Nevada. [7]

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Sustainable Water Resources for Sustainable Agriculture and a Sustainable Country

Ed George

“ We have to stop living as if we had unlimited water supplies and start recognizing that we must deal with serious water constraint, not how much water do we need and where do we get it, but, how much water is there and how can we best benefit from it”.
(Falkenmark, M., Natural Resources Forum, 1989).

“Throughout the world average per capita water availability has dropped from 16,000 to 7000 cubic metres between 1950 to 2000, as a result of population growth”. (FAO, Water Policies and Agriculture, 1994)

“Neither curricula nor career development currently allow much opportunity for the creation of a new generation of empirical agronomists with sustainable systems design in their terms of reference”. (Nosberger, J., Crop Science: Progress and Prospects: Fresno, L. O., Chapter 21, Crop Science: Scientific and Ethical Challenges to Meet Human Needs, Page 376).

Because of my farm heritage and interest in environmental and agricultural ecology, I wanted to research today's water needs in hopes I can better understand the complex uses and needs of water throughout the world. For that reason, I used the quotations in my introduction to address the urgency of water education.

Sustainable agriculture, economic development, food and water for a growing population, water navigation and environmental and ecological systems are all important reasons today for water conservation and preservation in Nebraska, the United States and a globalized world. All of these water uses are important reasons for wanting to have adequate supplies of good water to provide for a sustainable society.

Water is one of the major issues in sustainable development. Sustainable development in water resources basically means using water at a rate that is below or in balance with the rate of replenishment, without disturbing the

environment or ecosystem. Nebraska farmers are important food providers for

the world. They are users of the largest volume of groundwater in the United States from the Ogallala Aquifer and surface water primarily from the Platte River and its tributaries. Nebraska farmers are trying to sustain their farms without polluting the natural resources of water and soil, which are important for their success and survival.

Water, such a simple compound H_2O , sustains life for humans, plants, animals and the land in an interacting and changing ecosystem due in part to man's domination. The quantity and quality of water by all water users and consumers can have beneficial or harmful effects upon all of life's existence on the globe. I believe that every person needs to be a good steward by using wise stewardship of the water and land and have the wisdom to know how to achieve that task to sustain our natural resources.

Today's agricultural prosperity and success may not have happened if:

"On a dreary Saturday 70 years ago this month, (March), America was as close to collapse as it had ever been. The Great Depression in its fourth grinding year, fears of chaos and totalitarianism abounded. The President-elect, Franklin D. Roosevelt, knew what was at stake. Lights burned late in the White House as Roosevelt's "Brain Trusters" looked for ways to revive industries, rescue farmers and feed the Hungry. In what would be known as the "Hundred Days", Congress enacted the chief programs of FDR's New Deal, a blizzard of agencies known by their initials including AAA, CCC, NLRD, TVA, and FDIC". (AAA-Agricultural Adjustment Act, CCC-Civilian Conservation Corps, NLRD-National Labor Relations Board, TVA-Tennessee Valley Authority, and FDIC-Federal Deposit Insurance Corporation). (U.S. News, 70 years ago, The Week That Saved Capitalism. Lewis Lord. Page 2. March 31, 2003).

The New Deal was concerned with water use planning and a committee from the National Resources Planning Board "was concerned with data collection and analysis. It introduced or made dominant two major concepts in water analysis: 1) that of river systems or river basins, wherein any development in one part of a basin affected water quantity and quality in all other parts of the basin, so that development projects could no longer be looked at in isolation from other projects; and 2) the concept of multiple-use water development, whereby flood protection, navigation improvement, power generation, irrigation, waste disposal, and other water functions were considered each in relation to the others, and the whole typically was far more productive, in an economic sense than any single-purpose

water development". (Beyond the Urban Fringe Land Use Issues of Nonmetropolitan America, Rutherford H. Platt, George Macinko, University of Minnesota Press, 1983).

The changes to the High Plains from the Depression and Drought during the Dust Bowl era caused migration of the agricultural population and altered the ecosystem and landscape forever as told in the "Grapes of Wrath". My grandparents farmed in York County, Nebraska. Grandpa George talked about the struggles of farming the land, using the two-bottom plow and F-20 International tractor, which had neither an air-conditioned cab nor power steering. Plowing the soil exposed the earth to the winds, which blew the fragile soil into the ditches. Water, which never came when needed for the dying crops, had to come from the Dempster windmill (available still today in Beatrice, Nebraska) to water the animals, garden and the family. When the wind did not blow to the turn the blades on the top of the windmill, the five boys had to use the hand pump-jack to collect water in the buckets for the daily needs. Electricity, indoor plumbing and bathrooms were not even available until years later, as Gramps would say, "When I had some money".

Grandpa George believed in conservation of the soil and water. Gramps would hire a dowser, better known as the "water witch man" who walked the fields with a forked stick in his hands, hoping to find water when drilling for a new windmill. He planted trees to make shelterbelts to conserve the soil and water. He built terraces and dams to collect excess water from the fields and used crop rotation of corn, oats, wheat and legumes to feed the

livestock and chickens. These animals provided the meat and milk for the family, and the eggs and cream were sold to buy the necessary items which could not be raised. Grandpa George survived the Great Depression when “money was so tight that pennies were saved to provide for the family” by using sustainable practices of agriculture of that era, as a dryland and diversified farmer.

Gramps experienced years of working hard and not producing any crops for his livestock but the tumbleweed survived, as a drought tolerant plant, and provided feed for his livestock. He always saved and stored feed during the productive years when it rained. He always said, “Next year will be better”.

Gramps, in later life, talked about all the changes he had seen in his lifetime as electricity, tractors evolve from horsepower, corn pickers and combines versus the hand harvesting of corn. He marveled at the development of irrigation and center pivots which could produce 200 bushels per acre, \$5 per bushel for corn (a one time occurrence and not normal), compared to 15 cents per bushel during the 1930’s, hybrid corn breeding due to technology and genetics over the open-pollinated plants which he grew, saving the best ears, shelling them and planting the largest kernels for the next year. The use of pesticides and commercial fertilizers, he believed, would become important to help farmers feed the world. Today, all these advances of technology in agriculture are sustainable practices used by industrialized Nebraska farmers. There are many different concepts of sustainable agriculture, today.

Best management practices of field scouting, site-specific application of pesticides and fertilizers, contract production, residue management, value added production, soil and water testing and many other agricultural technologies are being used by Nebraska farmers. These systems have reduced the risks of farming. Many farm government programs also are helping farms to survive with price protection, loans and favorable interest rates to survive on the farms.

“Early pioneers of sustainable agriculture like William Albrecht, Aldo Leopold and Robert Rodale attempted to formulate an ecologically benign approach to agriculture that stressed the long-term health of a unique tract of land, a way of life, resource-conserving, and environmentally nonviolent”. (Ogallala, Water for a Dry Land. John Opie. Page 376). Gramps was that kind of man who respected his land because if “I take care of the land, it will take care of me and my family”.

Today, sustainable agriculture has made many improvements because of the water and irrigation management and tillage systems, which are more efficient and effective, thus changing the Dust Bowl of Nebraska to a Garden of Paradise. An important reminder of Nebraska agriculture today, is that irrigation is the largest consumer of water, which according to “Water Restrictions Hit Farmers and Ranchers Hardest”, (Lincoln Journal Star, Sunday, April 20, 2003, page 4C) reaches nearly 93%, but, “Tillage practices and crop residue management play an important role in the way that irrigation systems perform and are managed. Tillage practices affect the way that water moves into and off of the soil. Tillage practices also affect the way that water

moves from the soil into the atmosphere as evapotranspiration". (Nebguide, Crop Residue and Irrigation Water Management, G93-1154-A).

Today's Nebraska farmers are using no-till, ridge-till or conservation tillage to keep the residue on the surface to reduce the loss of soil and water on the irrigated fields. Crop residues serve an important role by reducing the amount of water required to produce crops. Research and testing by farmers and sustainable agronomists have found that physical conditions such as soil texture, soil structure, field slope, field length, furrow shape and the amount of crop residue cover, all have some impact on the performance of furrow and center pivot irrigation practices.

There is tremendous demand for water, particularly in the arid lands of Nebraska and the world. "Estimated groundwater use in Nebraska, 1995" (LJS page 4C), suggests irrigation uses 93.1%, public water supply uses 3.7%, livestock at 1.8%, 0.7% for self-supplied domestic, and 0.1% each for fossil fuel power and self-supplied commercial. Demands from technological developments of irrigation by agricultural farmers, increased world population growth, new water uses and environmental and recreational interests are all competing for the finite water supplies from rivers, lakes and groundwater. Some countries have even found that it is better to buy the grain for the people and animals from other countries than it is to grow the crops, and save their water for the people. Sandra Postel of World Watch Institute said, "Instead of continuously reaching out for more, we must begin to look within, within our regions, our communities, our homes and ourselves for ways to meet our needs while

respecting water's life-sustaining functions".

John Opie (1993) suggests,

"What actions can be taken, and are being taken, to sustain productive farming on the Plains, now that we know the Ogallala is not a limitless resource? The Ogallala problem is not unusual today. It is a problem taken up worldwide under the concept of human and environmental sustainability - How to maintain a satisfying standard of living into the future. Indeed, the Ogallala problem is one of America's best case studies in that it will reveal how a modern technological society will or will not succeed in achieving sustainability"

The Ogallala Aquifer, also called the High Plains Aquifer, is the nation's most abundant groundwater and fresh water supply (Zwingle, 1993). This enormous aquifer is groundwater trapped below estimates of between 134,000 and 174,000 square miles of land. Projections estimate there are over three billion acre-feet (an acre-foot is a foot of water across one acre, equaling 325,851 gallons of water) of water underlying eight states, from South Dakota to Texas. Nebraska has the largest quantity of water, believed to be 65% of that supply (Great Plains Symposium, 1998). Another viewpoint suggests that Nebraska groundwater has nearly 1.9 billion acre-feet. That is equivalent to a body of water thirty-four feet deep over the entire state. The quantitative amount of groundwater in Nebraska is equal to 25 years of the state's annual precipitation, is 250 times the annual stream flow, and is almost 700 times larger than the amount of water stored in surface reservoirs.

According to John Opie(1993), "The clear, fresh waters of the Ogallala are being unnaturally gulped up at ten times their pace of replacement. Over the next fifty years, when the world's food needs multiply five or ten times, the Ogallala waters, fulfilling Adam Smith's eighteen-century prediction, will become as precious as diamonds".

I experienced first hand the importance of the Ogallala Aquifer water supply, working as popcorn production supervisor. I was responsible for contracting farmers to grow popcorn, primarily in the states of Nebraska, Kansas, Oklahoma and Texas. The old water drive center pivots produced by Valmont and better known as Valley pivots were used to irrigate portions of the contracted fields. They were driven by water valve systems, which were inefficient or at the least wasteful of water. The Texas Panhandle was running out of water and many of these pivot systems were being dismantled and the sandy soil was returning to dryland farming. Recent reports say that 1% of the region is being abandoned each year because irrigation wells had gone dry. At the time, I realized the economic impact the groundwater of the Ogallala would have on the farmers and communities of Texline, Texas and Boise City, Oklahoma. John Opie shared this view in his book, "Ogallala, Water for a **DRYLAND**" (Author's emphasis).

Sidney, Nebraska, is faced with water shortages. The farmers there have found a solution. "Faced with the prospect of tight irrigation restrictions this summer, a group of Sidney farmers has developed a billion-gallon solution for stretching water supplies. The irrigators estimate that savings by voluntarily planting crops that consume less water, turning off the end-guns on

center-pivot irrigation systems and reducing the number of acres under irrigation" (David Hendee, Omaha World Herald, 2003). Nebraska farmers are beginning to see the importance of water conservation.

Nebraska has many if not all of the irrigation center pivot companies in the nation. They include Valmont (Valley), Lindsay (Zimmatic), Reinke (Electrogator), T-L and Lockwood. These companies represent the leadership of center pivot irrigation for Nebraska and the world. Center pivots can reduce gross water application by 10 to 40 percent. Some of the largest savings in agricultural water use have come about through technological development of the center pivot. A good center pivot irrigation system can achieve 80 to 90 percent efficiency in terms of water applied to the root zone. Center pivots lose 5 to 15 percent to evaporation, depending upon application time and temperature. A new sprinkler design using low-pressure nozzles and drops, known as low energy precision application (LEPA) instead of high-pressure nozzles, offers improved efficiency for the windy conditions of Nebraska by increasing infiltration rates, greater savings, yields and profitability. The USDA Farm Service Agency provides funds to farmers to convert their present high-pressure pivots to the improved newer pivot systems.

"Recent collaborative work in demonstration plots by the University of Nebraska (a leader in irrigation research), has shown that as much as 11 percent of the water applied for irrigation can be saved using scientifically based irrigation scheduling. Reducing runoff and deep percolation of water below the crop root zone boosted

efficiency another 15 percent" (LWV, 1997).

Irrigation development has dramatically improved agricultural production, but it has also contributed to water-quality problems for the household user and many communities. In Nebraska about 80% of the population drinks water from public supply systems. York County, Nebraska has approximately half the population using public supply systems, while the remaining households have private domestic wells. York County has experienced groundwater pollution, particularly of nitrates, much as the Platte River valley has seen for many years. York County farmers have been applying excessive amounts of nitrogen fertilizer to the landscape, often beyond the needed amounts. This groundwater pollution comes largely from leaching of commercial fertilizers, particularly in the form of nitrates. Efforts to decrease nitrate contamination of the Ogallala Aquifer in the York County area's groundwater has become a priority to the Upper Big Blue Natural Resource District serving the York County area. Nitrate levels in excess of 10 ppm (parts per million) have been found. This is the threshold level considered harmful to youth and pregnant animals. To monitor the primary drinking water supply, the Upper Big Blue NRD will test water samples provided by area households and irrigators to determine nitrate levels. This is an effective way to improve the quality of water, by reusing the groundwater as a fertilizer source the following year.

Water research has determined that each ppm of nitrates adds about 2.72 lbs. of nitrogen to the soil for each foot of water applied. A way to calculate the amount of nitrogen applied is to take the

ppm level times 0.23 times the inches of water applied. For example, applying 9 inches of water containing 9.2 ppm nitrates would equal 19 pounds of nitrogen during the irrigation season. Using this system has allowed farmers to reduce the amount of nitrogen applied thus saving money, and has also improved the quality of the groundwater supply and created another sustainable farming practice.

According to "State of Nations Ecosystem", Chapter 10, Urban and Suburban Areas: "About 60% of urban and suburban stream sites tested have concentrations of nitrate below 1 part per million; all samples were below the federal drinking water standard of 10 parts per million. Chapter 6, Farmlands: About 20% of the groundwater wells and 10% of the streams sites tested had nitrate concentrations that exceeded federal drinking water standards (10 ppm)".

A recent development of water issues for Nebraskans is the value of water for multiple users and out of state needs. "Water on the Rail" in the April 2003 issue of the Nebraska Farmer explains the value of Nebraska groundwater. Imagine if you can the selling of water for use in Colorado. "About 280 tanker cars, combined in three trains, would be filled weekly, with each car containing 26,000 gallons of water. That's approximately 7 million gallons a week, or about 22.3 acre-feet a week." Keith Olsen, Nebraska Farm Bureau president suggests that this is a "wake-up call for Nebraskans about the future of our most abundant natural resource. Water is a tremendous resource in Nebraska, but it is not unlimited. We must take appropriate steps to see that it is used wisely and for the benefit of all Nebraskans".

Susan Seacrest, president of the Nebraska-based Groundwater Foundation and organizer of the Groundwater Festival for school children in Grand Island (for more information, Laukaitis, Algis, Saving the Water, Journal Star, March 13, 2003), says, "Nebraskans have an ethical and civic responsibility to preserve and protect for future generations this "natural treasure" of Nebraska groundwater", and also realizes the importance of water sales. (Nebraska Farmer article) The ultimate responsibility of water sale and permits are in the control of the Nebraska Department of Natural Resources. Nebraska is unique in that the state has authority by the Legislature through the Department of Natural Resources to regulate water resources. Many regions in the world are not so fortunate to have this protection and interest in the water resource.

Colorado has experienced a severe drought. In Aurora, Colorado, a lack of snow has strained the city's 12 reservoirs, which are almost 40% below average. The city has taken a blow to the local economy as in the landscaping industry, which has lost \$75 million dollars in the last year. In Denver water reservoirs were 36% below normal. A recent heavy snowfall has helped to provide water, which will eventually or at least hopefully replenish the reservoirs.

Another example of water control was an in-depth article "Foreign control of water supply bothers user" in the Omaha World Herald issue, Friday, February 21, 2003. "Many Americans aren't so happy about foreigners controlling their water supply. A recently completed \$8.6 billion takeover of American Water Works by German-based industrial giant RWE has led to a

backlash from a handful of cities across America. The deal covers more than 800 water systems serving 15 million people in 27 states and three Canadian provinces." Another company, Vivendi Environment, which paid \$7.9 billion for USFilter in 1999, provides service to 110 million people in 100 countries that generates \$12 billion in annual revenue. USFilter runs Culligan bottle water service, and delivers water to about 13 million people in 600 communities.

Jon Bruning, Nebraska attorney general, also reinforces the importance of water. He writes in his article, "Nebraska must guard its interests in river" in the Omaha World Herald issue, March 28, 2003, "Whether it is safe and clean drinking water, water for agriculture, water for industry, water for power production or the water of the state we all enjoy for recreation, in Nebraska 'Water in life.' This is in regard to the Missouri River. The importance is water flow to the state for municipal, power, recreation and other interests. Regions in the upstream have experienced drought and are requesting the U.S. Army Corps of Engineers to stop flow of the water. As mentioned in the beginning of this report, the multiple use principle of water to all uses and users becomes a delicate matter. Water is a valuable resource, which we have, and it is an important responsibility in Nebraska that we must protect.

"Sustaining Water, Population and the Future of Renewable Water Supplies" is an in-depth and almost alarming article about water stress. This publication is available from Population Action International. I quote:

"Malin Falkenmark, a widely respected Swedish hydrologist, pioneered the concept of a "water stress index, based on an approximate

minimum level of water required per capita to maintain an adequate quality of life in a moderately developed country in an arid zone. Falkenmark began with the calculation that 100 liters per day (36.5 cubic meters per year) is a rough minimum per capital requirement for basic household needs to maintain good health. Falkenmark suggests specific thresholds of water stress and water scarcity. A country whose renewable fresh water availability, on an annual per capita basis, exceeds about 1,700 cubic meters will suffer only occasional or local water problems. Below this threshold countries begin to experience periodic or regular water stress. When fresh water availability falls below 1,000 cubic meters per person per year, countries experience chronic water scarcity. When renewable fresh water supplies fall below 500 cubic meters per person, countries experience absolute scarcity." As of 1995, 31 countries, with a combined population of over 458 million, faced either water stress or water scarcity.

United States is rated with an abundant supply of fresh water of 9913 cubic meters per person. Mexico has

4226 cubic meters per person. Saudi Arabia is classified as water scarce at 306 and Israel also at 461. This index reflects the importance of water in international conflicts, particularly if a country does not have other resources such as oil to sustain the people and their country to produce artificially made water.

The crisis of drought and thirst are conditions which all humans should be reminded about. The human body is 70% water; people begin to feel thirst after a loss of only 1% of body fluids and risk death if body fluid loss nears 10%. Every nation, every leader of all nations and every human being must use all possible practices to preserve our most precious resource, water. I end this report as I began with the quote:

"Instead of continuously reaching out for more, we must begin to look within, within our regions, our communities, our homes and ourselves for ways to meet our needs while respecting water's life-sustaining functions".

To become water wise, here are small steps with big returns that can conserve water:

1. Fix leaking toilets and faucets. A dripping faucet leaking one drop per second can amount to 25 litres per day. Over a year that equals 10,000 litres, which is enough water to wash more than 65 loads of clothing or 40 cars.
2. Never pour water down the drain when there may be another use for it, such as watering a plant or garden, or for cleaning around your house.
3. Install a toilet dam or displacement device such as a bag or bottle to cut down on the amount of water needed to flush.
4. In the shower, turn water on to get wet, turn off to lather up, then turn back on to rinse off. Repeat when washing your hair.
5. Do not use running water to thaw meat or other frozen foods. Defrost food overnight in the refrigerator or use the defrost setting on your microwave.

6. Avoid flushing the toilet unnecessarily. Dispose of tissues, insects and other similar waste in the trash rather than the toilet.
7. Wash the car with a bucket and rag, rather than using the automatic car wash.
8. Water the lawn and garden during the evening or early morning when water application is more effective to reduce evaporation loss. Never over-apply water to the lawn, but apply more frequently.
9. Cut your lawn between 5 and 8 cms high. Taller grass shades new growth, grows slower and needs less water.
10. Save water from the rainspout of buildings to use for the garden or house plants, rather than allowing the water to be wasted in the gutter.
11. Clean the driveway with a broom, not the water hose.
12. Reduce the lawn size by having areas such as rock gardens.

“Every drop of water saved today, provides for the next generation to have water to drink”, irrigate to produce food, wetland preservation, and water resources to sustain life. My hope is that we learn conservation by doing this practice.” quotation, Ed George.

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Land Use and Our National Parks

Andee McGinn

The National Parks System in the United States is unlike any system of parks in the world. It was created over a century ago with the intent of conserving the scenery and providing enjoyment for current and future generations. The national parks have benefited the people of the United States in a number of ways. This has not happened however, without controversy. The early years of the parks were a tumultuous time of learning how to operate a complex, nationwide system. There were concerns of the best way to protect the land and at the same time, make the best use of it. In more recent years, there have been issues with wildlife and disruptions in neighboring communities. This paper will address these and other issues that have arisen in the history of the national parks and the ways in which they have been handled by the government and citizens of the United States.

The idea for a park system such as that which became the National Park System is generally credited to the artist, George Caitlin. He wrote about his worries as early as 1832 of the impacts that westward expansion would have on the wilderness. He thought that the wilderness should be preserved "by some great protecting policy of government...in a magnificent park... a nation's park, containing man and beast, in all the wild and freshness of their nature's beauty!"

President Ulysses S. Grant declared on March 1, 1872 that a 2,000,000-acre area near the headwaters of the Yellowstone River would be preserved in perpetuity. Because there

was no state government at that time in the area, the park was under the control of the Federal government. This was the first national park in the world. There were many reasons that one may desire such a park but Grant said the park was "dedicated and set apart as a public park or pleasuring ground for the benefit and enjoyment of people."

There were motivations for creating parks besides Caitlin's idealistic nature preservation. There were many people, particularly those who had taken part in expeditions exploring the West who wanted the land preserved for what it was. Others had different ideas in mind. There was land, such as the cliff dwellings at Mesa Verde and some battlefields that had historical significance that people wanted to preserve. Once several parks had been established and it was clear that these would be possible destinations for tourists, the railroads began to take interest in the parks. More park visitors meant more railroad passengers, and the companies began to lobby for parks.

As of 1916 in all, there were 35 parks and monuments under the jurisdiction of the Department of Interior but there was no real management agency. In the first 14 years of Yellowstone as a park, chaos erupted. Vandals and poachers quickly disrupted life in the park. Seeing that this was a problem, the Department of Interior requested the assistance of the U.S. Army in overseeing the park. From 1886 to 1916, the Army oversaw the day-to-day actions within Yellowstone and the parks in California. Finally, the National Park Service was created in

1916 and took over the operation and management of the parks.

Controversy over how to best use the land within the National Park System began early in the history of the National Parks. One early controversy was over the use of water. The city of San Francisco is near the Hetch Hetchy Valley, which is a part of Yosemite National Park. In the early 1900s, San Francisco decided that it was paying too much for its water and decided to look for sources other than the company it was buying it from. Hetch Hetchy had pure water from the Sierra Nevada Mountains. The valley had perpendicular walls and a narrow outlet at the downstream end. This seemingly perfect location for a dam appeared to be the answer to the city's problems. There was no precedent telling whether the city should be able to use this water. John Muir and the Sierra Club, as well as other groups fought to save Hetch Hetchy. Other people sided with the city, claiming that they should use this resource to benefit the most people. One such person, Gifford Pinchot said, "The delight of the few men and women who would yearly go into the Hetch Hetchy Valley should not outweigh the conservation policy, to take every part of the land and its resources and put it to that use in which it will best serve the most people." On December 19, 1913 the Raker Act was passed, allowing the damming of the Hetch Hetchy Valley. Pinchot never admitted to being wrong in his decision to support the dam, but some close to him believed that he regretted this later in his life.

Currently, the Sierra Club and others are joining in a fight to restore Hetch Hetchy. They say that the land should be used as the founders of the National Parks intended. It should be

available for our enjoyment and scientific exploration in its natural state. The restoration of Hetch Hetchy is unlikely to happen in the near future due to the costs associated with disassembling the dam.

In part, because of what happened at Hetch Hetchy, there are now stipulations on the use of water from the parks. These stipulations include that the group receiving the water provides essential visitor services, there is no other source of water, the use of the water will not harm the environment and the group will cover the expenses of the use of the water. Water from inside the parks can also only be used on a temporary basis.

In more recent years, there has been controversy involving the reintroduction of wolves into national parks. The early years of colonization and westward expansion were spent in an effort to reduce the wolf population. Huge amounts of money were paid to those willing to capture and kill wolves. While this started on the east coast, the trend moved westward with the people. By the 1930s, wolf packs were seldom seen in Yellowstone National Park. Predator control in the parks ended in 1933 but the damage had been done and the wolf population did not recover. As early as 1944, Aldo Leopold called for restoration of the wolf population in Yellowstone. This did not happen for many years. Ranchers in the area surrounding the park were naturally opposed to the idea of reintroducing a predator species in an area near to their animals. In 1987, the National Park Service created the Northern Rocky Mountain Wolf Recovery Team. They held meetings with the public around the nation and determined that there was sufficient support to reintroduce wolves

into Yellowstone. Since the early 1990s, there have been wolves reintroduced to Yellowstone and areas of Idaho, with several breeding pairs.

While controversies such as Hetch Hetchy and the wolf restoration program continue to exist, the parks generally benefit those surrounding them. The parks bring businesses and jobs to the nearby communities. A 1982 study of Grand Teton National Park found that 27% of the county's employment and income came from the park. Property values near the parks are often higher than comparable properties not as close to the parks. People who live near national parks also have the benefit of having open space near them that will always be open space. The unfortunate side effect of the popularity of these spaces is the problems that come with tourists. More visitors mean more vehicles in the parks and surrounding areas. These vehicles contribute to air and noise pollution. Visitors are also not always considerate of the environment in their decisions on how to enjoy it. They can be the cause of accidental fires and can unintentionally damage sensitive plant and animal species.

The National Park Service now encompasses over 77 million acres in 49 states (all except Delaware), the District of Columbia, Puerto Rico, the Virgin Islands, Guam and Samoa. The management goal, "to protect the parks from degradation so that future and current generations are able to enjoy them" has not changed much from President Grant's initial intent. Not all of this however comes without cost. In 1995 it cost \$1,079,963,000 to run the National Park Service. Since the Park Service strives to keep the entrance fees to the parks affordable for most

Americans, most of this is paid with tax dollars.

The greatest changes occurring now and in the future are going to be in response to how our actions have harmed or are harming the environment that the National Parks Service was established to protect. Some parks are looking at limiting vehicle traffic within the parks by providing parking at the perimeters and installing mass transit systems. Since the parks were intended as a "pleasuring ground," they are working on ways that the parks can be used for recreation without harming the environment. One goal of the National Park Service today is education. The parks are beginning to focus on not only practicing but also teaching sustainability. By educating visitors to the parks, the Park Service is able to instill in its visitors a greater appreciation for what they are experiencing.

The National Park Service is not perfect. Its history has a number of flaws. There have been damages to the environment that its founders set out to protect. It has however done substantial good for the people of the United States. The National Parks have been a classroom for countless children and adults. They have preserved views which would have otherwise been bought up and built on as soon as the technology became available. The United States has the luxury not available in all parts of the world to have such land set aside for no other purpose than the enjoyment of the people. We should remember this in our land use planning. As more and more land is being developed, we need to make more of an effort to preserve these open spaces, even if they are not formally protected by the government.

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Economic Analysis of Land Use Alternatives 160 – Acre Parcel Lancaster County, Nebraska

Jered Morris

Introduction

In 1869, my great-great grandparents homesteaded a portion of Lancaster County southeast of Lincoln. Over the years, the ground served as the income source for several generations. However, in the last 20 years, the income has dwindled.

Recently, the farm changed ownership from my great grandmother to her children. This transaction, coupled with the economic situation of the farm, created a need to find what the best use of the farm should be. This question has spurred much discussion within the family and allowed me to use this course as a starting point in determining the answers to our many questions.

Within this paper, I plan to answer several questions regarding the future land use of this property that include:

- An economic evaluation of the current land use
- A discussion of the potential land uses available
- An evaluation and comparison of the proposed land uses

With this information, I will prepare several conclusions and recommend the most appropriate use of the land, economically.

Economics will only serve as one of the variables into the equation of the best use of the land. Other variables will include issues that the family has with any development, environmental and social impacts. This study will only

serve to answer the economic questions present on this parcel. Other variables will require further study and should be given equal time to fully evaluate the property.

Discussion

The discussion will be broken into two sections including a site evaluation and economic analysis.

Site Evaluation

The property is located in an area of rolling hills and spectacular vistas of the adjacent countryside. Located southwest of Bennet 2 ½ miles and southeast of Lincoln approximately 5 miles, the property has a strong central location (Figure A). A drive time to the new Wal-Mart complex is less than 7 minutes providing a reasonable convenience factor. In addition, services in Bennet are 5 minutes drive.

The site contains an array of existing infrastructure providing a foundation for any development potential. A rural water main is located within a ¼ mile of the site providing reasonable access to a reliable water source. A well maintained road network is also present with a gravel base. Future county upgrades to paved sections north of the site are proposed in the county 6-year capital improvements plan. Paved roads within the vicinity of the site would provide a major marketing boost for any development.

Adjacent land uses include large acreages in the order of 20 acres to the west of the estate. To the north and east is existing farmland while the south contains several additional large acreage parcels. The macro scale landscape contains a higher density of acreages to the east with varied acreage and farm parcels located elsewhere. This area continues to support a strong farm community despite the slow invasion of acreage developments in the vicinity.

On the property itself, several different land characteristics are apparent. First, the land generally slopes from north to south with the exception of the southwest portion of the site, which drains to the northeast. The property is generally cut in half by the Little Nemaha River, which drains from northwest to southeast. Several large and small trees are located within the floodway providing scenic focal points.

Human habitation on the property is isolated to the southeast corner where an existing home and outbuildings are located. The homestead parcel contains approximately 8 acres and has many old trees.

Overall, this property contains many of the items necessary for acreage development. These items include existing infrastructure conducive for higher densities (rural water and access) along with scenic vistas and natural beauty.

Economic Analysis

This section will be split by the land use discussed which will include:

- Continued Farming Operation
- Land Sale
- Acreage Development (AG and AGR Zoning)

For each land use, an evaluation of the economic data and forecasts will be established.

Continued Farming Operation

Currently, the farm is being rented out to a local farmer. This option has worked well in the past because of the low inputs required by the owner. However, the price of cash crops has not kept pace with inflation, and as such, the income from this operation in constant dollars has steadily declined over time.

The rental income is approximately \$90.00 per acre for the usable acreage on the property. Of the 160 acres available, only 120 are usable for farming. The remaining 40 acres consists of the homestead and the riparian areas within and directly adjacent to the Little Nemaha River.

When the math is completed, the gross yearly income from this operation is \$10,800.00. This does not account for property taxes and small contributions for inputs into the cash crop such as fertilizer and pesticides when applicable.

The per acre rental rate is somewhat low for the region because of the production capability of the property. The soils aren't the best available within the region or the county for that matter. Because of this, a conversion to a different land use may not be an adverse impact to the overall environment.

Land Sale

This option has presented itself several times within family discussions and looks quite attractive from a purely financial standpoint. Given the average land price within the county for 160-acre parcels, \$2,086.00 per acre, one might argue that the selling price estimate is too high. However, given the proximity to Lincoln, the development potential with the rural water network, and the aesthetics of the property, the \$2,800.00 per acre value placed on the property is a plausible development price.

This alternative contains several positives, particularly the ease of sale and the potential for high investment returns with a lump sum investment immediately. In contrast, with a development project to acreage uses, the return on investment would be dispersed over several years and the inputs to achieve the return would be much higher.

Acreage Development (AG and AGR Zoning)

Within the acreage development scenario, there are two general paths that can be taken. The first is an AG Zoning development where a change of zone is not required, but the density is low. The second scenario is the AGR Zoning, where a change of zone is required and the density is much higher.

Each development configuration was evaluated based on existing acreage sales data to determine what a reasonable gross revenue might be. In addition, amenities associated with these existing developments were evaluated and premiums were placed on the lot sale price. With this information, an

adjusted sale price per acre was found to best correlate with our property.

The average land sales for three categories were calculated to include acreages between 2 and 4 acres, 4 and 8 acres, and 8 and 15 acres. Based on this information along with a regression analysis, a cost equation was determined to correlate with the acreage configuration on our development.

$$T = 17,343.82 - 1056.39x$$

Where T = Acreage Price (\$)

x = Acreage Size (acres)

The next step included a preliminary design for each scenario to determine the infrastructure required along with the potential revenues from lot sales.

AG Zoned Development

For this development type, two designs were established on the site to serve as alternatives and to demonstrate the variability in costs based on differing layouts.

Concept 1 (Figure B) shows an acreage layout utilizing the north and east portions of the site with a general land use delineation along the Little Nemaha River. This design contains large acreages on the order of 5-10 acres. In addition, this concept provides several potential lot owners with spectacular views of the countryside to the south. Finally, the concept has several lots abutting the Little Nemaha that add to the lot sale potential.

This concept contained a lot sales projection of \$618,143. When taking into account the development costs of \$262,224 and a pro forma analysis, the

cumulative cash flow is estimated to be \$273,736.

The next concept designed for an AG zoning demonstrates a different layout which greatly changed the bottom line. The second concept shown in Figure C has lots only on the southwest side of the property generally splitting the site again by the Little Nemaha River into the different land uses.

The unique aspect of this design is that a very small area is used for development while the majority of the land is set aside for continued farming operations or alternative crops.

Overall, this concept demonstrated a potential sales revenue of \$483,972. When considering the development costs of \$237,623 and estimated pro forma, the cumulative cash flow is calculated to be \$166,039. The difference between concept 1 and 2 is mainly the lot sizes. With the smaller lot sizes, the potential revenues are greatly decreased while the hard and soft costs are relatively consistent.

AGR Zoned Development

This development scenario contains the most inputs from an infrastructure standpoint along with increased time and risk associated with zoning changes. The potential return on the investment in this scenario is also the most rewarding.

When looking at the concept in Figure D, it is easy to see that the amount of dwelling units is much greater. In fact, with the AGR Zoning, the allowable density is 1 dwelling unit per three acres as opposed to 1 dwelling unit per 20 acres in the AG Zoning. With this in

mind, the concept shown does not fully utilize this density. However, with the existing acreage sales within the county, this concept fully utilizes the maximum return per acre with a 3-acre parcel. Various physical constraints also affected the layout of this plan. For example, the stream creates a large barrier to higher density along with topographic constraints. The design takes into account the increased costs associated with mass grading operations, which were avoided in the design. As is seen in the road network, the contour of the land was used to limit excess grading.

Overall, this development condition would create the highest potential lot sales revenue of \$1,277,415. However, the infrastructure costs are significant at \$541,989. When evaluated with a pro forma, the potential cumulative cash flow is estimated at \$613,114. This represents the highest return on investment from all the acreage development plans.

Conclusions

The land use strategies presented contain several good and bad aspects with each of them. The continued farming operation requires little input of additional resources, will still provide an income, however small, but none-the-less, an income. Is it possible for this to outpace inflation?

With the straight land sale, a large return is taken up front in year one. When comparing this return with the acreage development plans, this option no doubt beats the AG Zoning approaches. However, under close scrutiny, this plan is quite competitive with the AGR

Zoned development because of external investment potential with the up front lump sum payment. With an 8% return, the \$347,600 profit from a land sale would yield \$595,725 in year 7. This comes quite close to the cumulative cash flow of the AGR Zoned plan.

The AG Zoned concepts demonstrate the lowest return on investment with all the risk involved with development. It is easy to see that concept 1 is the better option economically when compared with concept 2. However, if an alternative use could be established on the farmland left over, the potential returns could be attractive for concept 2 given its abundance of undeveloped land.

The AGR Zoning scenario contains the highest risk of all the options available. However, the rate of return could be large. Taking into account that the pro forma for this concept is quite conservative, it is possible that lot sales projections could be accelerated to a condition where revenue is greatly increased. With recent lot sales in similar developments, this is a good possibility.

Recommendations

Overall, the initial capital outlay on the acreage development scenarios of approximately \$40,000 could make these plans cost prohibitive. With this in mind, the easiest and safest plan would be a straight land sale.

This option also contains the negative of a loss in ownership and direction on the land. It is my recommendation that the land is not sold for this reason.

Given the information presented in this paper, the best scenario to accommodate all interests would be the AG development scenario. With this plan, a decreased amount of time would be spent in platting along with a decrease in infrastructure costs in comparison to the AGR development plan. In addition, either concept provides a large amount of land left over for an income source. The land could either be farmed in corn, milo, and soybeans as it currently is, or changed to an alternate crop.

By allowing a mix of land uses to occur on the land, options will be abundant for future opportunities in alternative farming. In addition, the benefits of development could be met by platting 9 lots to serve as seed money for an alternative crop or retirement funds.

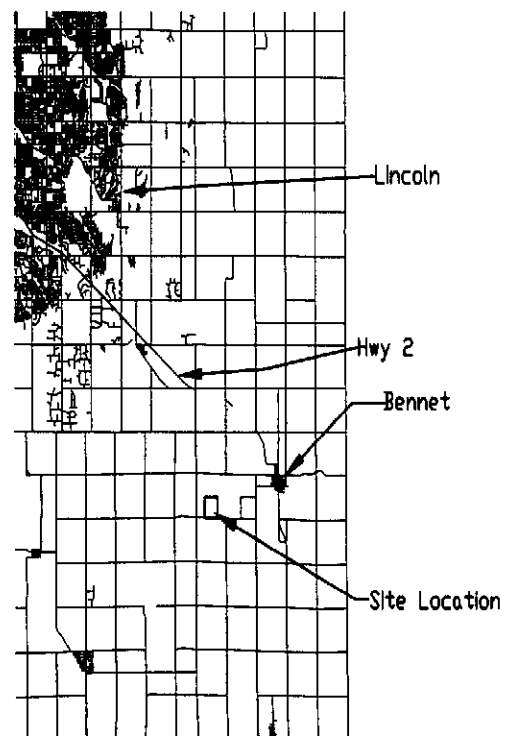


Figure A. Vicinity Map

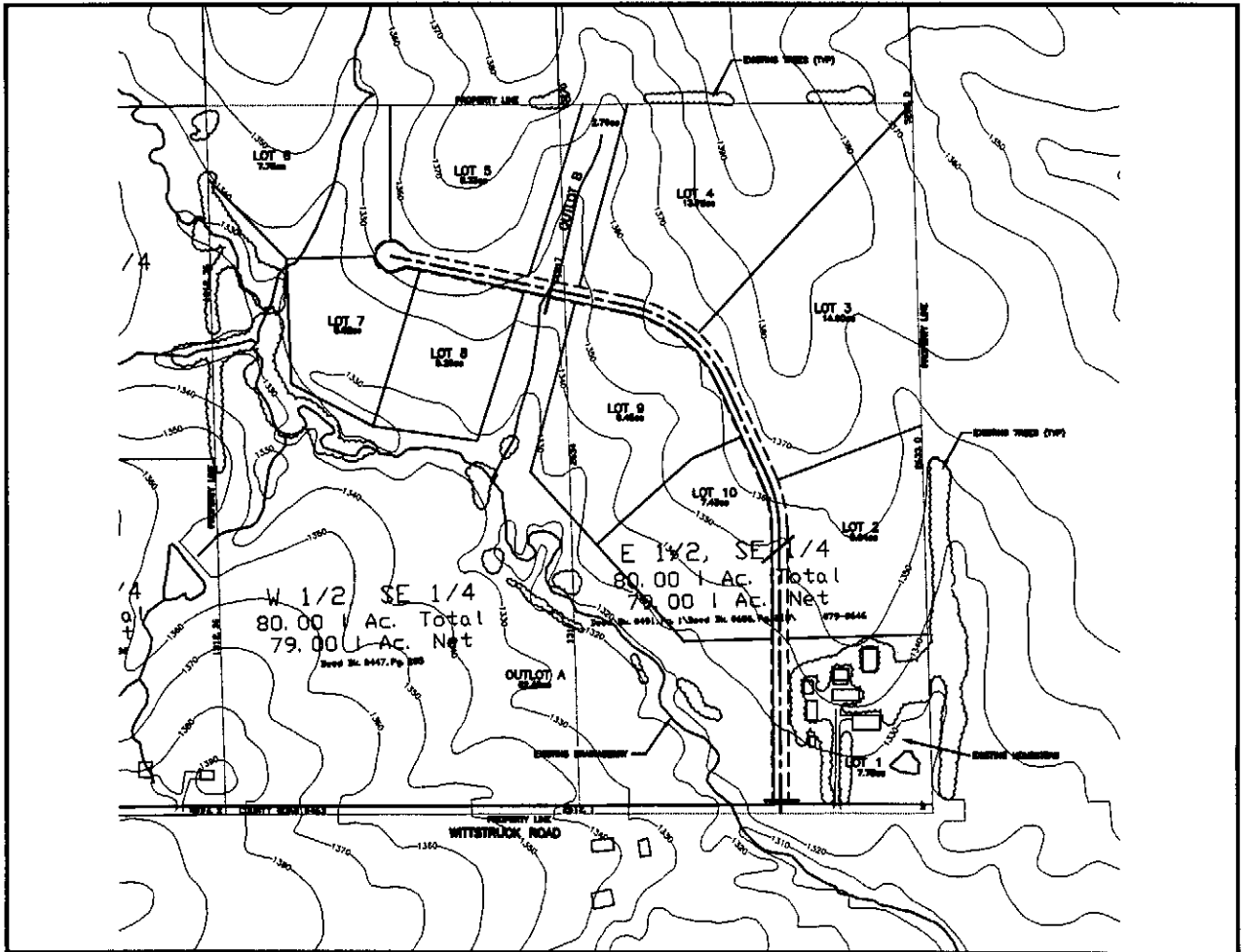


Figure B. AG Zoning Concept 1.

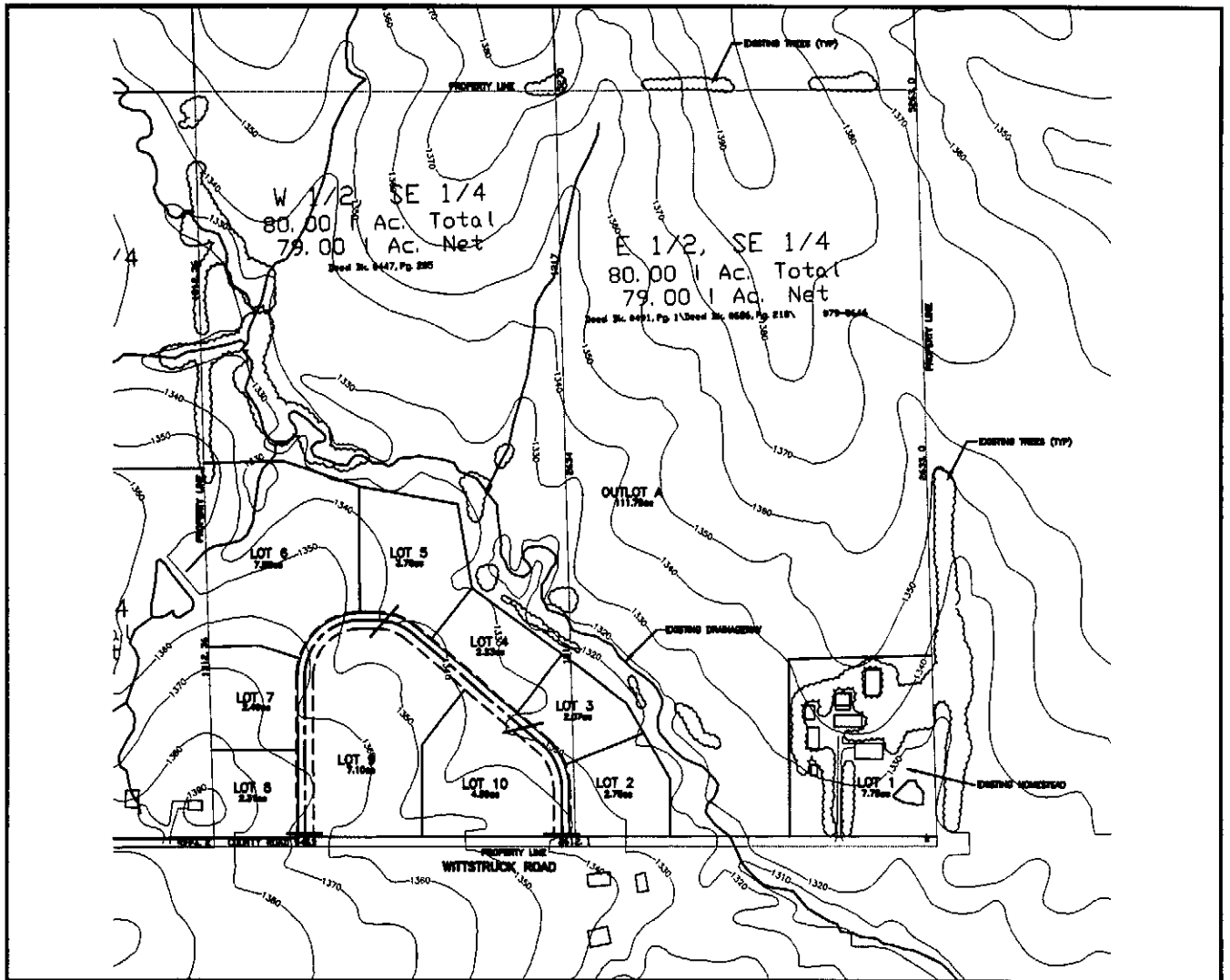


Figure C. AG Zoning Concept 2.

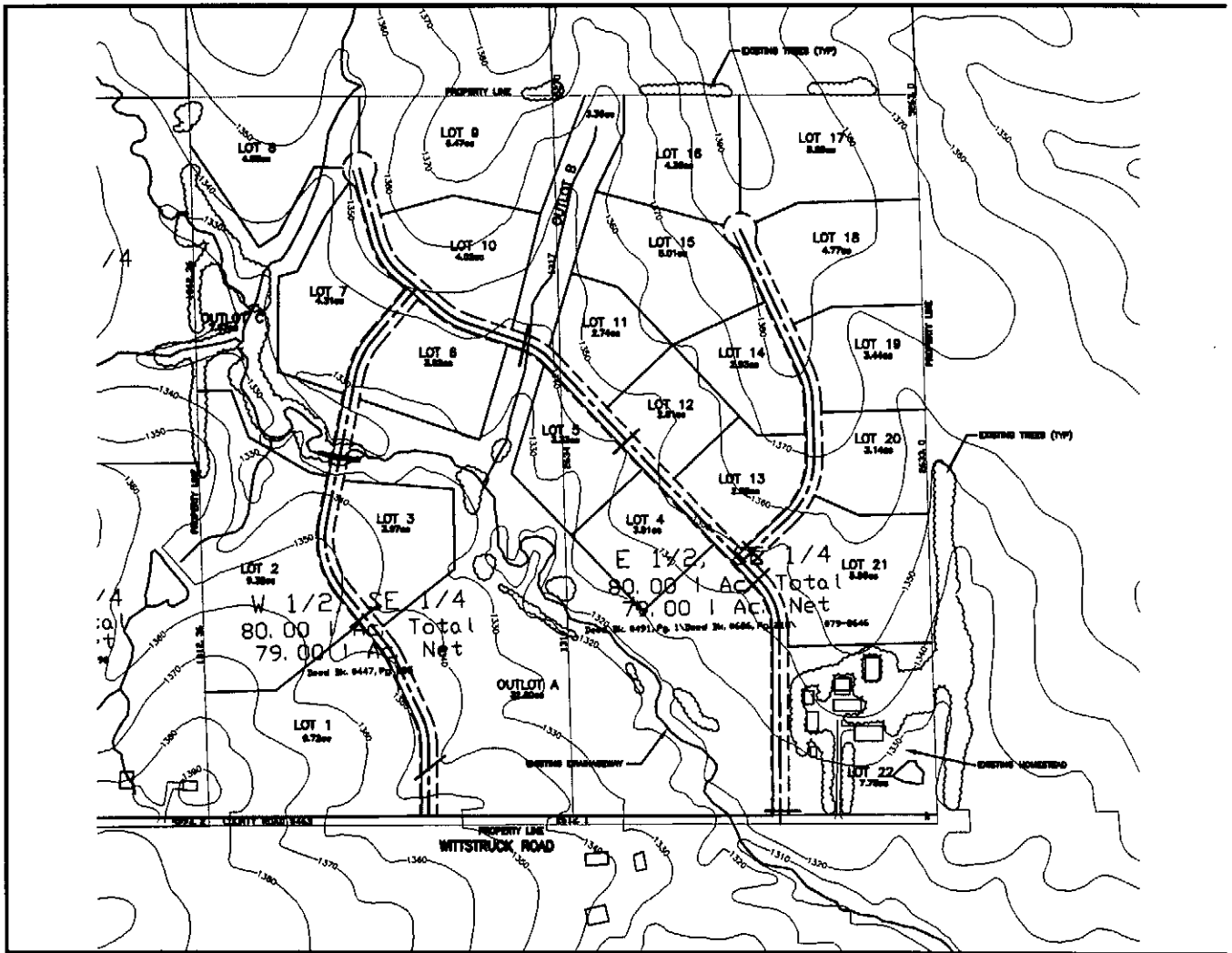


Figure D. AGR Zoning Concept.

References

- ¹The City of Lincoln and Lancaster County Comprehensive Land Use Plan. 2002.
- ²County Assessors Office, Lancaster County, Nebraska. Acreage Sales 2000-2003.
- ³County Assessors Office, Lancaster County, Nebraska. Land Sales 2000-2003.
- ⁴United States Geological Survey: Bennet Township Quadrangle Topographic Map.
- ⁵RSMeans, Heavy Construction Cost Data, 13th Edition (1999).



Does the ability to construct water wells for use in filling acreage ponds contribute to the urban development of rural lands?

James Newman

The project I selected involved conducting two surveys to determine the attitudes both land owners and regulatory agencies have toward the development of natural resources for urban development. The first survey asked all 23 individual Natural Resources Districts if they issue permits to construct water wells for use in filling ponds. The second survey asked landowners who have registered wells under the classification of "Other use" if they felt the filling of ponds for various purposes, one of which is aesthetics of urban development, is a beneficial use. After analysis of the survey results I determined if any significant correlation existed between the two survey groups.

The survey of Natural Resources Districts (NRD) was sent to the individual responsible for issuing permits for water wells designed to yield 50 gallons or greater per minute. The survey asked each NRD if they issued permits to fill ponds (see appendix A- NRD Survey). The purpose of asking these question of each NRD was to see if there is any correlation between pond permits and urban sprawl. The results of the survey were anonymous in nature as explained in the cover letter mailed with each survey (see appendix A- letter to the NRD).

Although the surveys were anonymous, I was able to identify the five NRDs located in SE Nebraska by the post mark on the return envelope. For the purpose of comparison to well owner responses I compared these results to the other NRD responses. The overall results showed that the majority

of SE Nebraska NRDs do issue permits for the filling of ponds for all uses, including the aesthetics of urban development (see table 1). Comments from the responding NRDs in SE Nebraska are included in Appendix C. The results further showed that the majority of other NRDs in Nebraska do not issue permits for the filling of ponds, including for the aesthetics of urban development (see table 2). Comments from the respondents of the non SE Nebraska NRDs are included in Appendix C. Therefore, the responses received from 17 of the NRDs showed that a majority of the NRDs associated with urban sprawl in SE Nebraska do issue permits to acreage owners wishing to construct ponds. In discussion with an insurance agent I was informed that the presence of a pond of adequate size to provide fire suppression for rural fire fighters would not decrease the insurance premium on the acreage (Carey Dart, interview, Farmers Insurance Group, April 30, 2003).

The survey of well owners purpose was to determine these individuals' definition of beneficial use. The results were to determine if their wells were used to fill ponds and if so for what use (see Appendix B- survey well owners). Although these survey responses would be anonymous, only wells associated with the large urban growth areas were selected for the survey (see Appendix B- letter to well owners). The wells registered as "Other use" with the Nebraska Department of Natural Resources (DNR) that were

located in Douglas, Dodge, Sarpy, Cass and Lancaster county were selected for the interview. A total of 45 wells were selected for the survey, of which ten responses were received. These responses showed that six of the ten well owners did have ponds that were filled by water wells. The majority of the well owners felt that filling ponds for any use was of benefit (see table 3). Comments from the respondents of the well owners are included in Appendix C.

The results of both of the surveys conducted appeared to show some correlation between NRDs and well owner locations and responses. The majority of the well owners responding to the survey did have ponds that were filled by water wells. In addition, these well owners felt that the use of ground water to fill ponds for aquatics, irrigation, wildlife enhancement and for the aesthetics of urban development were all beneficial. With respect to these wells in the region of urban growth in SE Nebraska, three of the five NRDs in SE Nebraska issue permits for all these purposes. In contrast, the majority of other NRDs in the state do not issue permits for filling ponds for these uses.

In analyzing these responses two questions arise. First, why do NRDs issue permits to fill ponds for aesthetic purposes, even though it appears to contradict state statute? And secondly why doesn't the trend of the SE Nebraska NRDs follow through in the other NRDs? To answer the first question I would refer to one of the other NRDs comments "Board approves, even though NRD cannot issue by state statute". The Board is a political subdivision of the state and comprised of elected members. Therefore, there may be pressure from constituents to accept these wells in part due to vagueness in

the state statute and from constituent pressures. Secondly, the NRD receives revenue from property tax. It is possible that the NRD may see acreage development as a higher revenue base than agricultural land. The answer to the second question may be that the majority of the other NRDs are more rural in nature and do not have the urban development pressures.

In summary, I feel that this survey was a valuable tool in analyzing the inconsistency of enforcement of the state statute by individual NRDs. This issue may be addressed by the current Governor's Water Policy Task Force. I feel this issue should be addressed. I have no doubts that in the near future beneficial uses will be more closely scrutinized due to the current drought and water rights issues.

Table 1**SE Nebraska NRD SURVEY RESULTS:**

Are permits issued for water wells to fill ponds issued for-

	Yes	No
Aquiculture	4	1
Irrigation	3	2
Wildlife	4	1
Aesthetics	3	2

Table 2**Other Nebraska NRD SURVEY RESULTS:**

Are permits issued for water wells to fill ponds issued for-

	Yes	No
Aquiculture	5	7
Irrigation	3	9
Wildlife	4	8
Aesthetics	3	9

Table 3**Well Owner SURVEY RESULTS:**

Is filling a pond for the following uses a beneficial use?

	Yes	No
Aquiculture	8	2
Irrigation	8	2
Wildlife	7	3
Aesthetics	6	4

Appendix A. Letter to the NRD

MM/DD/YY

NRD Rep.

Dear NRD Rep.

I am writing to you to request your participation in a survey for a class project I am completing. The topic of my project is: "Permitting of water wells for filling of acreage ponds, does this contribute to the development of rural lands"?

The survey is part of a research project looking at the correlation between rural development and the issuance of permits to construct water wells designed to pump greater than 50 gallons per minute for beneficial use. I am requesting your participation in this survey as an individual directly involved with the permitting of these types of wells.

Participation in this survey will take 15 minutes to one half hour. The survey consists of four questions and a comment section. Once the survey is completed, please enclose the survey only in the return envelope provided. The envelope is a self addressed and stamped for return mail.

The risks of the survey are minimal, as the responses will be kept confidential by the anonymous method of response and return. The results of the survey will not be reported directly to the participant, however the results will be published in a class journal for Agronomy 496, Spring 2003. The information reported in the journal will be aggregated data and will not identify individual respondents.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in the survey. Or you may call the investigator at any time, phone (402) 435-9985. If you have any questions concerning your rights as a research subject that have not been answered by the investigator, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Participation in this survey is voluntary, and you may decide not to participate at any time without adversely affecting your relationship with the investigator, the University of Nebraska or LPS. Your decision will not result in any loss of benefits to which you are otherwise entitled.

Compensation will not be offered for participation, however your time is greatly appreciated.

Sincerely,

James Newman

The Survey: NRD

I am a student at the University of Nebraska in an Agronomy class entitled Urbanization of Rural Lands. As a Term project for the class we have been asked to conduct an analysis of urban development. I have selected to survey the individual Natural Resources Districts within the State to ask about the issuance of permits to construct water wells for "Other" use.

I appreciate the time you have given to review this letter and hope you will respond to my survey. The response to the questions will be kept anonymous; no record of the individual Districts responses will be kept. The responses will be summarized for the entire state as a whole.

The District issues permits to construct water wells to fill ponds for aquaculture?

☐ Yes ☐ No

The District issues permits to construct water wells to fill ponds for wildlife enhancement?

☐ Yes ☐ No

The District issues permits to construct water wells to fill ponds for irrigation of lands?

☐ Yes ☐ No

The District issues permits to construct water wells to fill ponds for the aesthetics of rural development?

☐ Yes ☐ No

Comments:

Please return the enclosed survey in the self addressed stamped envelope provided.
Thank you again for your time and attention to this request.

Appendix B. Letter to Well Owners

MM/DD/YY

Well Owner

Dear Well Owner,

I am writing to you to request your participation in a survey for a class project I am completing. The topic of my project is: "Permitting of water wells for filling of acreage ponds, does this contribute to the development of rural lands"?

The survey is part of a research project looking at the correlation between rural development and the issuance of permits to construct water wells designed to pump greater than 50 gallons per minute for beneficial use. I am requesting your participation in this survey as an owner of a well registered as "Other use".

Participation in this survey will take 15 minutes to one half hour. The survey consists of five questions and a comment section. Once the survey is completed, please enclose the survey only in the return envelope provided. The envelope is a self addressed and stamped for return mail.

The risks of the survey are minimal, as the responses will be kept confidential by the anonymous method of response and return. The results of the survey will not be reported directly to the participant, however the results will be published in a class journal for Agronomy 496, Spring 2003. The information reported in the journal will be aggregated data and will not identify individual respondents.

You may ask any questions concerning this research and have those questions answered before agreeing to participate in the survey. Or you may call the investigator at any time, telephone (402) 435-9985. If you have any questions concerning your rights as a research subject that have not been answered by the investigator, you may contact the University of Nebraska-Lincoln Institutional Review Board, telephone (402) 472-6965.

Participation in this survey is voluntary, and you may decide not to participate at any time without adversely affecting your relationship with the investigator, the University of Nebraska or LPS. Your decision will not result in any loss of benefits to which you are otherwise entitled.

Compensation will not be offered for participation, however your time is greatly appreciated.

Sincerely,

James Newman

The Survey: Well Owners

I am a student at the University of Nebraska in an Agronomy class entitled Urbanization of Rural Lands. As a Term project for the class we have been asked to conduct an analysis of urban development. I have selected to survey water well owners in SE Nebraska that have drilled wells classified for "Other" use. The survey will be anonymous and no record of individual landowners responses will be recorded

Do you think pumping ground water to fill ponds for aquiculture is a beneficial use?

☐ Yes ☐ No

Do think pumping ground water to fill ponds for wildlife enhancement is a beneficial use?

☐ Yes ☐ No

Do you think pumping ground water to fill ponds for irrigation is a beneficial use?

☐ Yes ☐ No

Do you think pumping ground water to fill ponds for the aesthetics of rural development is a beneficial use?

☐ Yes ☐ No

Dose your property have a well that is used to fill a pond?

☐ Yes ☐ No

What would you consider to be the use, from the above list, of the pond?Use:

Comments:

Please return the enclosed survey in the self addressed stamped envelope provided.

Thank you again for your time and attention to this request.

Appendix C

Comments from SE Nebraska NRDs

1. Questions 2, 3, and 4 will depend on proposed legislation
2. Haven't received an application for well to fill pond, may have irrigation wells used for this purpose at this time.

Comments from Other Nebraska NRDs

1. Water well moratorium in effect
2. No phase I area in District, no permits required
3. Current statute 46-656.30 state that permits must be denied if use is not beneficial use of water for domestic, agricultural, manufacturing or industrial purposes*
4. Wells pumping less than 50 gallons per minute do not need a permit
5. Although Board approves, legally by state law the NRD cannot permit these aesthetic use wells

*State of Nebraska Department of Natural Resources Ground Water- Chapter 46, Article

- 46-613 Ground Water; declaration of policy; preference in use. Domestic, Agriculture, Manufacturing, Industrial.
- (1) domestic use of ground water shall mean all uses of ground water for human needs as it relates to health, fire control, and sanitation and shall include the use of ground water for domestic livestock as related to normal farm and ranch operations.
- (2) agricultural purposes shall include, but not be limited to, aquaculture as defined in section 2-3804.01.

Well Owner Use and/or Comments

1. For aesthetic use I would like the pond to be a reasonable size and depth.
2. Pond receives discharge from heat pump water, wildlife benefit
3. Wildlife enhancement, GOOD LUCK
4. Recreation
5. Recreation
6. Aquaculture
7. Urban aesthetics and lawn irrigation
8. Well only pumps 15 gallons per minute, pond is filled by runoff and snow melt.

State of Nebraska Department of Natural Resources Ground Water- Chapter 46, Article

- 46-613 Ground Water; declaration of policy; preference in use. Domestic, Agriculture, Manufacturing, Industrial.
- (1) domestic use of ground water shall mean all uses of ground water for human needs as it relates to health, fire control, and sanitation and shall include the use of ground water for domestic livestock as related to normal farm and ranch operations.
- (2) agricultural purposes shall include, but not be limited to, aquiculture as defined in section 2-3804.01.



Environmental Ethics and Landscape Perception: An Instrument for Measuring Relationships

Mindi Schneider

"The land ethic simply enlarges the boundary of the community to include soils, waters, plants, and animals, or collectively: the land."

Aldo Leopold, *A Sand County Almanac*

"[T]he social allocation of land to different uses and activities is fundamentally and inextricably a problem of ethics. This is so because such land-use decisions have, both individually and cumulatively, tremendous social and environmental impacts."

Timothy Beatley, *Ethical Land Use: Principles of Policy and Planning*

I. Introduction

The concept of environmental ethics is deeply rooted in Aldo Leopold's quotation on the preceding page. In *A Sand County Almanac*, Leopold reveals and explains his idea of the land ethic. The notion of enlarging the ethical boundary to include the land was revolutionary at the time. The land is not only a nonhuman entity, but a conglomeration of both living and nonliving things. At any rate, contemporary studies of environmental ethics result directly from the influence of Leopold and his worldview.

The purpose of the proposed instrument is to measure the relationships between environmental ethics and landscape perception. This study is one piece of a larger conceptual puzzle. Ethics are thought to influence attitudes, which in turn influence

behavior. Measurement of these three areas will inform a more complete view of the agricultural picture. Figure 1 is a conceptual interpretation of the larger study. Boxed items indicate measurable variables; arrows indicate both the sample population for the study and the measurement tools to be used. *ACAP* refers to the "Alternative - Conventional Agriculture Paradigm Scale" developed by Beus and Dunlap (1990) to measure basic beliefs and values assumed to constitute the two competing perspectives in agriculture.

The measurement tools used for this piece of the study are discussed in the following sections.

II. Survey of Environmental Ethics

Empirical treatment of environmental ethics in the literature is minimal. Valliere and Manning (1994) conducted a study to test the influence of environmental ethics on public attitudes toward wilderness management. Through intensive literature review, 16 different environmental ethics were identified and categorized into five broader categories with theoretical commonalities. The study instrument included a questionnaire consisting of 62 statements to measure agreement or disagreement with the 16 environmental ethics, in addition to statements to measure attitudes about wilderness purity. Negra and Manning (1997) used a similar approach to examine the incorporation of environmental behavior, ethics, and values into environmental education programs. An additional ethic was added to the 16 from the 1994

study, and levels of agreement with a series of ethical positions were again used as the measurement tool. Samples were drawn from Vermont State Park visitors for both studies, and relationships were illustrated between environmental ethics and the other desired study objectives.

The Survey of Environmental Ethics for this study (Appendix B) builds on the literature. Environmental Ethics are defined as intellectual ideas about the appropriate relationship between humans and the natural environment. Eighteen environmental ethics grouped into the five broader categories are used. Ethical statements are presented as a bipolar scale with levels of agreement presented between each position. Table 1 shows the framework for empirical measurement of environmental ethics, including the theoretical categories, the ethics, and the measurement definitions.

III. Landscape Perception Study

Legislation in the United States and Great Britain in the 1960s and early 1970s directed attention toward the identification and management of scenic resources, giving rise to several studies of landscape preference in the 1970s and 1980s (Zube, Sell, and Taylor 1982). Studies of this kind have continued, and paradigms have been identified. According to Kaplan and Kaplan (1989), the human species is strongly oriented to visual and spatial information, and is quick to have feelings about "seen" things. Further, peoples' responses to two-dimensional representations are surprisingly similar to responses when they are in the setting itself (p. 16). Landscape Perception Studies have been used extensively by planners, landscape architects, and natural resource managers to draw on principals of visual

aesthetics and landscape design, ecological theory, and biological resource management concepts (Zube 1984). A frequently repeated finding in many of the empirical studies is high agreement among subjects on the perceived scenic quality of more natural landscapes (Zube 1984). Sullivan's (1994) landscape perception study at the rural – urban fringe supported these findings. The response categories containing no buildings were most preferred.

The instrument proposed for this study is a variation on several previous landscape perception studies. Two bipolar scales consisting of eight items each (Appendices C and D) have been developed for use with two categorical groups of landscape images (Appendices E and F). The first scale is for use with "Land Use Images", and the second scale is for use with "Farm Management Images".

Scale development is based almost entirely on the work of Timothy Beatley (1994) in *Ethical Land Use: Principles of Policy and Planning*. His quotation on the first page of this paper is a very powerful statement linking ethics to land use. While he does not address environmental ethics in particular, comparisons between the ethical framework of each will be insightful. Beatly further offers a list of principles and imperatives for ethical land-use policy based upon the major components of a theory of ethical land use (p. 262). Items from this list have been modified and implemented as a scale for landscape image assessment of ethical land use. A scale item is also included in the second scale to illustrate Leopold's (1949) idea that the land ethic reflects an ecological conscience and conviction of individual responsibility

for the health of the land. Further, "Health is the capacity of the land for self-renewal" (p.258).

Most of the photographic images were downloaded from the USDA Photographic Library () and the NRCS Photographic Library (). If other sites were used, they are identified in the tables below. The first group of images shows different land uses, focusing on activities at the rural/urban fringe. Table 2 summarizes the images. The second group of images shows different farm management practices. Table 3 summarizes the images.

IV. Procedure

The intended use of this instrument is to define relationships between environmental ethics and landscape perception; specifically, attitudes about land use and farm management. The study will be conducted with the help of Jim Peterson, the Extension Educator for Washington County, Nebraska. Ideally, the study will be carried out during a function that is already planned and well attended by farmers in the county. This will avoid problems associated with attempts to gain a "critical mass" for conducting the survey.

All subjects will initially be asked to complete the Survey of Environmental Ethics. Questionnaires will be collected before beginning the Landscape Perception Study. A few demographic items will also be requested.

The landscape images will be projected using a Power Point program. For each image, subjects will be asked to complete all eight items for the appropriate scale. In other words, data

will be generated for attitudes about the principles of ethical land use as applied to images of land use and farm management.

In order to explore relationships between the variables, multiple correlation and regression analysis will be performed using SPSS software.

V. Applications

Information from this study will help us to gain insight for Washington County farmers about the following:

- Environmental ethics
- Landscape perception and land use preferences
- Relationships between environmental ethics, land use preferences, and demographics
- Attitudes about the rural/urban interface
- Attitudes about farm management.

Again, this study is one piece of a larger puzzle for determining the relationships between ethics, attitudes and actual behavior. In general, empirical treatment of ethics provides information for prediction of actual production systems used and consumer behavior in the market. This type of information can be useful for decisions concerning farm policy, planning, and alternative market potentials. In addition, information about environmental ethics can be useful in better understanding the core of a community.

VI. Considerations

An initial trial run of the instrument was previewed by the Urbanization Class on April 23, 2003. Several things will need to be considered before a "real" trial is conducted. First,

instructions need to be clearer to avoid confusion. Perhaps the photo images will be given simple labels like "Conventional Subdivision", or "Conservation Tillage" to avoid further confusion about what is really at issue. The images, scales, and survey of environmental ethics will also need to be assessed by another audience.

Because empirical treatment of ethics is rather limiting, other forms of research will be sought as well, resulting in a kind of "Mixed Methods" or "Mixed Model" study. The empirical data will provide a means of fitting this study into

the existing literature. However, because the nature of the subject being considered does not fit neatly into a box, we must look for alternative methods of getting to the roots of environmental ethics in the food system.

Perhaps at the intersection of environmental ethics, paradigmatic worldviews, land use attitudes, and farm system behavior lies a new theory for practical application of a *land ethic*. It is hoped that this study will provide both interesting and useful information for the food system in Washington County, Nebraska and beyond.....

Figure 1. Conceptual Diagram of Environmental Ethics, Attitudes, and Behaviors.

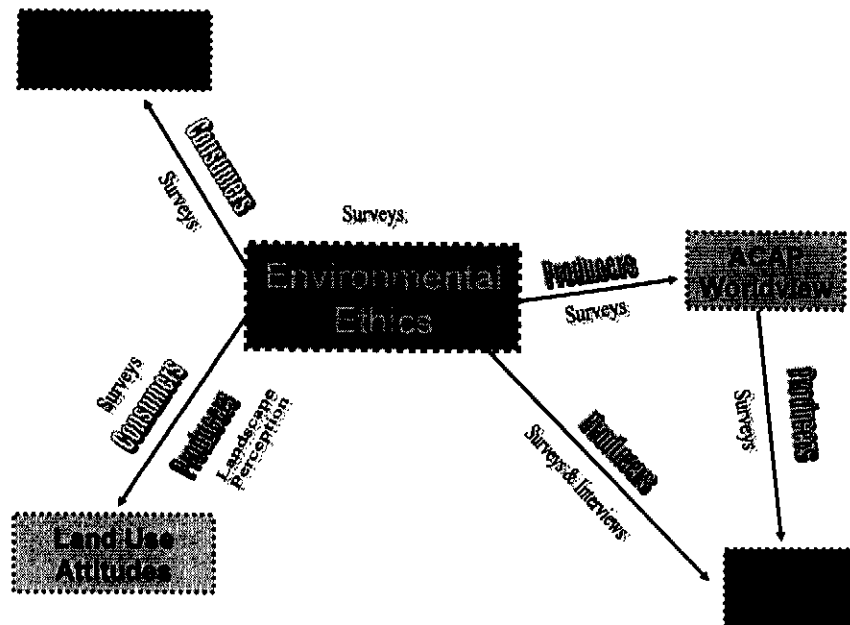


Table 1. Framework for 18 Environmental Ethics

Theoretical Category	Environmental Ethic	Measurement Definition
Anti-environment		Nature should be controlled by humans
	Threat to survival	Nature can be dangerous to human survival
	Nature as evil	Nature is sometimes evil and should be tamed
Benign Indifference		Humans have no moral relationship with nature
	Storehouse of raw materials	Nature is a valuable storehouse of raw materials that can be used without limit
	Religious dualism	Humans were created as fundamentally different from other living things
	Secular dualism	The ability to think makes humans fundamentally different from other living things
Utilitarian Conservation		Human should exercise caution in their use of nature
	Anthropocentric humanism	Cruelty towards animals makes people less human
	Efficiency	The supply of goods and services provided by nature is limited
	Quality of life	Nature adds to the quality of our lives
	Ecological survival	Human survival depends on nature and natural processes
Stewardship		Nonhuman entities have a moral status
	Religious/spiritual duty	It is our spiritual/religious duty to take care of nature
	Future generations	Nature will be important to future generations
	God's creation	Nature is God's creation and should be respected
	Mysticism	All living things have a spirit
Radical Environmentalism		There is an ethical hierarchy
	Humanitarianism	Animals should be free from needless pain and suffering
	Animism/pantheism/organicism	All living things are sacred and should not be disturbed by

		humans
	Liberalism - evolution	Humans are related to other living things through evolution
	Liberalism – ecological processes	Humans are related to other living things through ecological processes

Modified from Negra and Manning (1994).

Table 2. Landscape Images for Land Use at the Rural/Urban Interface

Land Use	Photograph	Photographer
1. Conventional Subdivision	Las Vegas, Nevada	Lynn Betts, 2000, NRCS
2. Conservation for Hunting	Pheasants in cornfield, Iowa	Roger Hill, 2001, NRCS
3. Urban	Downtown Seattle, Washington	Gary Wilson, 2000, NRCS
4. Farm	Farm, Iowa	Lynn Betts, 1999
5. Acreage Development	Farm with sign "SOLD 35 Acres"	Ken Hammond, USDA
6. Golf Course	Rocky Gap Lodge and Golf Resort, Cumberland, Maryland	Curt Carlson, 2001, Golfcoursepics.com
7. Urban Sprawl	Housing development abutting cornfield, Nebraska	Bob Nichols, 2000, NRCS
8. Prairie	Konza Prairie	http://climate.konza.ksu.edu

Table 3. Landscape Images for Farm Management Practices

Management Practice	Photograph	Photographer
9. Feedlot	Mixed breed cattle feedlot	Unknown, USDA
10. Conservation Tillage	Conservation tillage in corn, Iowa	Lynn Betts, 1999, NRCS
11. Wind Power (Alternative energy source)	Wind generators, Iowa	Lynn Betts, 2000, NRCS
12. Strip Cropping	Aerial photo, Iowa	Tim McCabe, 1999, NRCS
13. Pesticide Application	Tractor with boom, Louisiana	Bob Nichols, 2000, NRCS
14. Windbreaks	Aerial photo, North Dakota	Erwin Cole, 1997, NRCS
15. Residue/Stubble	70% residue, Kansas	Jeff Vanuga, 2002, NRCS

Management		
16. Pasture	Pasture, Nebraska	Tim McCabe, USDA

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Appendix B. Survey of Environmental Ethics

The Relationship between Humans and the Natural Environment

Listed below are several *pairs of contrasting views* regarding the relationship between humans and nature. For each pair please indicate *which one of the two views you most agree with* - the one in the left-hand column or the one in the right-hand column - by circling the appropriate number on the line between them.

1 = STRONGLY AGREE WITH THE VIEW IN THE LEFT-HAND COLUMN

2 = MILDLY AGREE WITH THE VIEW IN THE LEFT-HAND COLUMN

3 = UNDECIDED

4 = MILDLY AGREE WITH THE VIEW IN THE RIGHT-HAND COLUMN

5 = STRONGLY AGREE WITH THE VIEW IN THE RIGHT-HAND COLUMN

*****Please circle *only one* number for each pair*****

A. Nature is a valuable storehouse of raw materials that can be used without limit	..... 1 2 3 4 5 6	The supply of goods and services provided by nature is limited
B. Nature can be dangerous to human survival	..... 1 2 3 4 5 6	Human survival depends on nature and natural processes
C. It is our spiritual/ religious duty to take care of nature	..... 1 2 3 4 5 6	Nature should not be protected
D. Nature is sometimes evil and should be tamed	..... 1 2 3 4 5 6	Nature is God's creation and should be respected
E. Cruelty towards animals makes people less human	..... 1 2 3 4 5 6	Cruelty towards animals has no impact on people's humanity
F. Nature will be important to future generations	..... 1 2 3 4 5 6	Future generations will not rely on nature
G. Nature adds to the quality of our lives	..... 1 2 3 4 5 6	Nature detracts from the quality of our lives
H. Humans were created as fundamentally different from other living things	..... 1 2 3 4 5 6	Humans are related to other living things through evolution
I. All living things are sacred and should not be disturbed by humans	..... 1 2 3 4 5 6	Humans have no moral relationship with nature
J. Humans are related to other living things through ecological processes	..... 1 2 3 4 5 6	The ability to think makes humans fundamentally different other living things
K. All living things have a spirit	..... 1 2 3 4 5 6	Only humans have a spirit

L. Animals should be free from needless pain and suffering	..... 1 2 3 4 5 6	Animals cannot feel pain or suffer, so their treatment is unimportant
M. Nature should be controlled by humans	..... 1 2 3 4 5 6	Human should exercise caution in their use of nature
N. Nonhuman entities have a moral status	..... 1 2 3 4 5 6	Only humans have a moral status

Appendix C. Landscape Perception Study... Scale #1 for use with Images 1-8 (Land Use Images)

Landscape Perception Study

Listed below are several *pairs of contrasting views* regarding appropriate/ethical land use. For each land use image please indicate which *one of the two views you most agree with* - the one in the left-hand column or the one in the right-hand column - by circling the appropriate number on the line between them.

1 = STRONGLY AGREE WITH VIEW IN LEFT-HAND COLUMN

2 = MILDLY AGREE WITH VIEW IN LEFT-HAND COLUMN

3 = UNDECIDED

4 = MILDLY AGREE WITH VIEW IN RIGHT-HAND COLUMN

5 = STRONGLY AGREE WITH VIEW IN RIGHT-HAND COLUMN

*****Please circle *only one* number for each pair*****

This land use:

1. Benefits the welfare and interests of society at large	..... 1 2 3 4 5	Benefits the welfare and interests of only a few
2. Protects and conserves the natural environment	..... 1 2 3 4 5	Abuses or harms the natural environment
3. Enhances prosperity of future generations	..... 1 2 3 4 5	Compromises prosperity of future generations
4. Should not be subsidized by the government	..... 1 2 3 4 5	Should be subsidized by the government
5. Respects historical and cultural resources	..... 1 2 3 4 5	Damages historical and cultural resources
6. Prevents or minimizes physical harms to people	..... 1 2 3 4 5	Causes physical harms to people
7. Discourages unique lifestyle choices	..... 1 2 3 4 5	Encourages unique lifestyle choices

8. Is not economically viable 1 2 3 4 5 Is economically viable

**Appendix D. Landscape Perception Study... Scale #2 for use with Images 9-16
(Farm Management Images)**

Listed below are several *different pairs of contrasting views* regarding appropriate/ethical land use. Please follow the previous instructions for the following images.

This land use:

1. Protects and conserves the natural environment	..... 1 2 3 4 5	Abuses or harms the natural environment
2. Enhances prosperity of future generations	..... 1 2 3 4 5	Compromises prosperity of future generations
3. Acceptable to neighbors	..... 1 2 3 4 5	Unacceptable to neighbors
4. Is not economically viable	..... 1 2 3 4 5	Is economically viable
5. Prevents or minimizes physical harms to people	..... 1 2 3 4 5	Causes physical harms to people
6. Should not be subsidized by the government	..... 1 2 3 4 5	Should be subsidized by the government
7. Enhances ecosystem functions	..... 1 2 3 4 5	Compromises ecosystem functions
8. Reduces the land's ability for self-renewal	..... 1 2 3 4 5	Enhances the land's ability for self-renewal



Urban and Rural Land-Use Conflicts in Lancaster County, Nebraska

Chris Schroeder

Since the inception of the classic Euclidian zoning, this land-use planning concept has been utilized to separate incompatible land-uses to protect the general welfare, health, and safety of the general public (Levy, 1997). However, conflicts can still arise between two adjacent zoning districts when an adequate distance or buffer zone is not provided to minimize these potential conflicts (Daniels, 1995). This paper seeks to examine the potential conflicts between agricultural zoning (rural) and residential zoning (urban) and the extent to which some or all of these conflicts occur in Lancaster County, Nebraska.

The project's methodology focused on utilizing record or case review of the Lincoln-Lancaster County Health Department's (LLCHD) Health Environment System (HES).

Possible land-use conflicts between agricultural and residential uses include, but not all encompassing, complaints regarding noise, odor, dust, vandalism, damage from aerial spraying, and nuisances (Olson and Lyson, 1999).

Odor complaints can originate from several sources within an agricultural setting. The most obvious sources include odorous emissions from livestock operations and the spreading of manure for fertilizer. However, additional sources can include the exposure of organic material from various farming activities such as tilling fields in preparation for the plating season. This same phenomenon can be observed when parcels of land are graded for future developments. Ironically, these lands are often

agricultural lands that are being converted into residential uses.

The source of noise complaints from agricultural uses is fairly straightforward. The complaints can originate from noise produced from farming equipment including tractors, combines, grain dryers, grain storage bins, and semi trucks. Of note, noise pollution from farm equipment will be most noticeable during evening hours due to the reduction in background noise from the area (May, 1978).

Dust complaints can arise from basic farm operations in which several factors combine to produce excessive dust emissions from agricultural lands. Dry weather and high winds often will increase dust complaints. While it is not purely an agricultural use, the LLCHD receives complaints regarding dust generated on rural gravel roads.

Vandalism is another negative impact that can result from agricultural and residential land-use conflicts. In this instance, it is the agricultural use that is impacted from surrounding residential uses in which residential populations may vandalize adjacent agricultural land and/or buildings (Olson and Lyson, 1999).

The application of chemicals via aerial spraying may lead to complaints resulting from damage to residential personal property. Pesticides and herbicides have the potential to impact vegetable gardens and other plants or shrubs.

Furthermore, nuisance is an additional land-use conflict between residential and agricultural uses in which

the activity or nuisance infringes on the complainant's ability to enjoy the use of their property (Luther, 2001).

As aforementioned, this paper focuses on land-use conflicts between residential and agricultural uses within Lancaster County, Nebraska. To adequately address and examine land-use conflicts, the following will be a discussion of applicable regulations which often play a direct role in the complaint process for land-use conflicts.

The City of Lincoln Municipal Code Chapter 8.02 Health and Safety Hazards. Generally the purpose is to essentially protect the public from activities or practices which could pose a threat to public health. With respect to agricultural uses, 8.02.30 discusses the improper storage, handling, or disposal of any hazardous material which creates a potential health hazard to the public or hazard to the environment.

The City of Lincoln Municipal Code Title 8 Chapter 24 Noise Control Ordinance. The purpose is to protect the public from noise pollution that could have a negative impact on public health or degrade the quality of life. Specifically, this code addresses noise pollution by specifying sound level limits in decibels for a ten minute period or the average sound for a ten minute interval by the receiving land use category or zoning. With respect to land-use conflicts between urban and rural uses, noise complaints regarding rural uses can result from noisy farm equipment, grain bins or dryers, or from general farming operations.

The City of Lincoln Municipal Code Title 8 Chapter 06 Air Pollution Ordinance. The purpose is to protect the public's health from the possible negative impacts from air pollution. In the context of urban and rural conflicts,

sections 130, 140, and 150 could have direct applicability for the filing of complaints against rural land owners.

Section 130 addresses odor nuisances that are prohibited. This section does have a provision in which animal confinement and feeding operations are exempt providing that they meet specific requirements or criteria. Section 130 states that a violation may be established when, "upon complaint of three or more unrelated people within a thirty-day period at their residences that any detectable odor endangers or potentially endangers health, safety, or welfare, or is unreasonable offensive or objectionable causing unreasonable interference with the use or enjoyment of the complainant's property."

Section 140 addresses the prohibition of the open burning of refuse or salvage material. This regulation could have direct applicability for urban and rural conflicts in which rural residents may utilize open burning as an acceptable waste disposal practice. Finally, section 150 addresses the prohibition of air pollution nuisances which is essentially the emission of several different types of particulate matter.

Nuisance case law can also play a role or have an effect on urban and rural land-use conflicts (Luther, 2001). A nuisance can be defined or described as any activity which infringes on a person's right to enjoy their property (Luther, 2001). To apply this legal tool or course of action, a person must file a civil suit against their neighbor or the person that is causing the nuisance.

Zoning, which is under Title 27 of the Lincoln Municipal Code, is an additional important regulation which can play a role in the interaction of land-

use conflicts. The zoning for a parcel of land specifies which uses or permitted uses are allowed by right on the property. In addition, most zoning districts also specify permitted conditionally uses in which there is a specific set of conditions that must be met for a particular use. There is also special permitted uses which require the approval of a special permit to conduct the specific activity.

Often, the permitted or conditional uses can be in conflict with some of the aforementioned regulations regarding rural and urban land-use conflicts. A good example is that under agricultural zoning, agricultural practices are a permitted use. However, some agricultural practices may lead to odor complaints under the Lincoln Municipal Code Air Pollution Ordinance 8.06.

In order to determine if land-use conflicts exist in Lancaster County, Nebraska, the LLCHD's HES data system was used to conduct a records or case search for complaints regarding agricultural uses. First, two study areas were delineated using Geographic Information System (GIS) software to determine areas in Lancaster County in which agricultural zoning is adjacent to residential or agricultural residential zoning. (See the appendix for study area 1, figure 1, and study area 2, figure 2 – not here shown).

The case or records search focused on complaints that were received from 1998 through 2002. The search focused on complaints for five major types in the HES data system: open burning, visible emissions, foul odor, excessive noise, and pesticides. For each of the five years sampled, case files were then identified and retrieved that had complaints in one of the five types of complaints.

The addresses for each of the cases previously identified were entered into a database and stored as a dbf file. Arcview GIS was then used to geocode or locate the addresses for each of the cases previously identified. The final cases for study chosen by the cases or records that fell within one of the two previously delineated study areas.

The final results of the study were obtained by tabulating the total for each complaint type by year. See the tables below for the raw collected data for each study area.

Overall, the results of the study do not indicate a significant problem with land-use conflicts between urban and rural land-uses. However, it should be noted that this study relied on information supplied by the LLCHS's HES data system. It could be argued that some of the complaint numbers could be higher if other agencies were contacted for information.

In addition, the public's awareness level of the previously discussed ordinances could play a role in the seemingly number of complaints logged by the LLCHD's HES data system. This phenomenon is somewhat true for the public's understanding of noise control ordinance.

Study Area 1 Results

	1998	1999	2000	2001	2002
Complaint Type					
Foul Odor	2	3	2	3	3
Visible Emissions	2	3	3	2	3
Excessive Noise	0	1	0	0	1
Open Burning	0	1	0	2	0
Pesticides	1	0	0	0	0

Study Area 2 Results

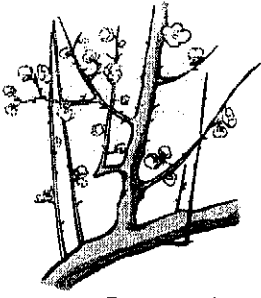
	1998	1999	2000	2001	2002
Complaint Type					
Foul Odor	1	1	2	1	2
Visible Emissions	2	3	1	3	3
Excessive Noise	1	1	0	0	1
Open Burning	1	2	0	0	1
Pesticides	0	0	0	0	0

Focusing on foul odor and visible emission complaints for the two study areas, overall for these two complaint types, study area 1 had a higher mean. Study area 1 had an annual mean of 2.6 foul odor complaints whereas study area 2 had a mean of 1.4 foul odor complaints. The mean for visible emission complaints was 2.6 for study area 1 and 2.4 for study area 2.

It can be hypothesized that the higher means for study area 1 for the foul odor and visible emission complaints could be for the influence of the prevailing wind direction in the summer months for Lancaster County. The prevailing wind direction in the summer months is from the south which should play a role in the transport of these foul odors and particulate emissions to area 1.

In conclusion, it only makes sense that these complaints should continue to increase as agricultural lands are encroached upon by high or medium density residential developments. To ensure the survival of farming

operations, a fine balance must be struck between the regulations protecting public health and the quality of life for the farmer. One possible solution could be the creation of a new zoning district with the purpose of providing a buffer between urban and rural land uses. Such a zoning district already exists to buffer residential uses from commercial uses. This zoning district is the residential transition zoning district for the city of Lincoln. The hypothetical agricultural counterpart transition zoning district should focus on minimizing densities and increasing distances between urban and rural land uses.



Supplementing Income Through Alternative Crops

Joseph D. Smith

In recent years farmers have been finding it harder and harder to make ends meet through their farming practices. Many simply succumb to urban pressure and sell their land for a big profit and retire, while some are finding that getting part-time jobs are a better option. What many farmers do not know about are alternative crops to help supplement their income, especially specialty forest products. Specialty forest products are an up and coming new way to help supplement dwindling profits on farming practices.

Specialty forest products generally fall into four categories: medicinals and botanicals, forest-based food products, woody decorative florals, and handicraft products and specialty woods. This paper will focus on the aspects of woody decorative florals, from planning, planting, maintaining, and marketing. To many people's surprise money can actually be made from these practices.

Woody decorative florals consist of medium to large sized shrubs that are utilized in the floral industry in floral designing. Willows (genus *Salix*) and Dogwoods (genus *Cornus*) are the two groups of shrubs that have the greatest demand. Other shrubs have a demand for their spring flowers but take much more labor and expertise than the two aforementioned. These two groups are prized for their bright colors and unique forms in floral design. This niche within woody decorative florals is the best option for farmers due to timing of labor needed.

New Venture Factors

When first looking into growing woody decorative florals there are several factors to consider, the first being land. With proper planning and layout, no additional land will be needed for existing farmers. By using a technique called "alley cropping" farmers can maximize profits while minimizing costs. By simply planting these shrubs in existing fields' drainways and water-ways, unused land will become productive money generating land. These shrubs can also be planted along fencerows, along field perimeters, and around outbuildings to maximize use of empty land.

The second factor to be considered, and definitely one of the most important, is the market for these products in your area. Several vendors to consider when marketing your products include: Retail and Wholesale florists, Supermarkets, Nurseries/gift shops, and hobby or craft stores. It is best to find a wholesale florist to buy your products because of their ability to buy in large quantities. They also do all of the selling from that point on, saving the grower time and money on marketing efforts. The main concern is to not get stuck with your product, because unsold product is lost money.

The third factor to look into before starting a new venture is the equipment and supplies needed for operations. No special equipment is needed for growing woody decorative florals. The main piece of equipment used is a mower to keep weeds and grass down around the shrubs being grown.

Proceeding further, the grower needs very few specialized supplies. The main specialized supply is a cooler to store the post-harvest crop in. Also supplies to provide irrigation, if necessary, will need to be purchased. Irrigation is generally not needed, especially if the fields are already irrigated for the general field crops being grown. The fourth and final major factor to be considered when venturing into growing woody decorative florals is start up and maintenance costs. Table 1 shows per unit costs at two different spacing distances. These numbers may vary depending on where you buy your initial plants and in what size you buy them.

Labor Requirements

Labor requirements are one of the most scrutinized aspects of woody decorative florals and specialty forestry products in general. When most people look into growing these products they want to know how much they have to contribute to the project and how much money they will receive in return for the products they have grown. Labor requirements are especially important when looking to this as a supplement to regular agricultural practices. Most farmers do not have a lot of excess time and labor to be putting into these ventures because of their normal agricultural practice requirements.

The bulk of the labor requirements come during mid to late November, while most farmers are not busy. This is when the stem harvest is undertaken and completed. After the stems have been harvested from the plants, the stems must be graded and bundled according to size. Also during this time stems must be inspected for quality, as quality is the most important factor to buyers of the product. Any

stems with major defects must be culled from the group of sellable stems and thrown out. After all harvesting, grading according to size, and bundling have been completed, the stems should be stored in a cooler in buckets of water to prevent drying and hardening of the stems.

The only other major labor requirement during the winter months is marketing of the stems. For the most part, the only time you will have a hard time finding someone to sell your products to is the during the first year or two. Once a relationship is built with a wholesaler or retailer to buy your product, generally that relationship will continue on year after year. If a large enough wholesaler is found, like Denver Wholesale, all your product may go to one buyer, eliminating additional time invested in marketing of your product.

During the spring and summer months the only labor requirements are for spraying and mowing of weeds and grass. It is a good idea to keep weeds down around the perimeter of your shrubs to help decrease competition for water and nutrients. Spraying only needs to be done two times a year, and mowing only needs to be done every couple of weeks, give or take because of the weather. Other than these two tasks the shrubs generally take care of themselves.

Woody Decorative Florals Market

As discussed earlier under marketing factors, there is an ample number of outlets where you can sell your product. In general, demand has always been greater than supply for woody decorative florals because of seasonal availability. More and more wholesalers and retailers are looking for producers who can provide quality

product year round rather than only one time per year (usually in the winter). Also many hobby and craft stores are looking for local producers of woody decorative florals to supply them with dried products since shipment through the mail often leads to extensive damage and high costs.

Shown in Table 2 and Table 3 are Nebraska and National current market sales. As shown at the national level of the market, over 7 million dollars per year is attributed to only five varieties of plants that can be grown. There are almost twenty different varieties of shrubs that can be grown and marketed, so 7 million dollars in sales is only a portion of the total market.

Potential Problems

Several potential problems can be found in growing of woody decorative florals. One of the most prevalent problems is with insects, and more specifically grasshoppers. Grasshoppers have a tendency to cause the more problems than any other insect because of their voracious appetites and general preference to eat at the stems of the shrubs. If a grasshopper eats at the stems of the shrubs the wound will heal and leave a scar, making the stem undesirable in the market. Several thousand dollars can be lost due to grasshopper damage if not controlled early through pesticides.

Another potential problem comes from deer browse and deer rub. There is generally low to moderate browse preference on the willows and an extremely high browse preference on the dogwoods and birch. Conversely, there is a high preference of deer rub on the larger willows, with a lower preference of deer rub on the dogwoods and sweet birches. There is not much you can do

to control the deer, other than use a fence where applicable. Other animals such as rabbits and small rodents may also cause problems by eating the bark off the lower portions of the shrubs, causing girdling in severe cases. Once again not much can be done to control these animals from their harmful ways.

Finally, a major problem lies in the alley cropping approach to growing these shrubs. Many farmers are highly likely to choose a "Round-Up Ready" variety of corn or soybeans to plant in their fields to help control weeds with ease. This poses a deadly threat to the shrubs planted in the alleys of the fields. If caution is not taken and these shrubs get a douse of the Round-Up being sprayed in the field, they will die just like the rest of the weeds in the field. To help control this problem a large grass buffer may be planted around the plants, or using other varieties of crops and not using Round-Up on the fields.

Conclusions

In conclusion, woody decorative florals possess definite potential for alternative income generation for farmers. Much research is being done at universities and private locations to help increase profitability and quality of these operations. This is just another way for farmers to supplement their income, saving farms from the blade of urbanization.

TABLE 1

Woody Floral Establishment and Maintenance Costs
(Per 1,000 linear feet)

Year 1 Costs (Establishment Year)	Unit Cost	Total Cost 6' Spacing	Total Cost 4' Spacing
Site Preparation (per linear foot)	\$0.05	\$50.00	\$50.00
Planting Costs	\$0.30	\$50.00	\$75.00
Plant Material Costs	\$0.70	\$117.00	\$175.00
Weed Control: 2 herbicide applications/year/foot	\$0.02	\$40.00	\$40.00
YEAR 1 TOTAL:		\$257.00	\$340.00
Year 2 Costs (all years past year 1)			
Replacement of Dead Plants	\$0.70	\$23.40	\$35.00
Weed Control: 2 herbicide applications/year/foot	\$0.02	\$40.00	\$40.00
YEAR 2 TOTAL:		\$63.40	\$75.00
Total costs for years 1 & 2		\$320.40	\$415.00

TABLE 2

Nebraska Woody Floral Market

	# Of Stems Sold	Value
Pussy Willow	70,500	\$56,400.00
Curly Willow	68,400	\$54,720.00
Red Dogwoods	53,700	\$42,960.00
Red (Sweet) Birch	3,500	\$2,800.00
Flowering Stems	7,400	\$11,100.00
TOTAL	203,500	\$167,980.00

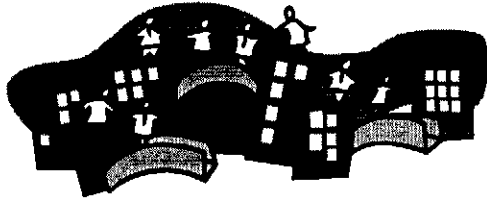
TABLE 3

National Woody Floral Market

	# Of Stems Sold	Value
Pussy Willow	331,000	\$1,241,250.00
Curly Willow	902,000	\$4,961,000.00
Red Dogwoods	47,855	\$215,348.00
Red (Sweet) Birch	93,132	\$465,660.00
Flowering Stems	152,600	\$839,300.00
TOTAL	1,526,587	\$7,722,558.00

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Smart Growth and Its Origins

Steven Zimmer

At the millennium, we have a unique opportunity to change the prevailing pattern of sprawl and to lay the groundwork for how we want to live in the next century. We can do so through more efficient use of the resources that were left behind as people moved outward in the metropolitan areas. Redirection of a portion of growth to the inner-metropolitan area, combined with a more controlled movement outward, would consume far less capital and fewer natural resources and enable the achievement of more ambitious development goals. In many cases, redirecting just 20 percent of the growth headed for areas outside central cities and inner suburbs would double or triple the growth projected for the inner areas (Burchell, 1999).

Smart Growth is an effort, through the use of public and private subsidies, to create a supportive environment for refocusing a share of regional growth within central cities and inner suburbs. At the same time, a share of growth is taken away from the rural and undeveloped portions of the metropolitan area. This is accomplished by revitalizing the region's future growth. While this is happening, the regional economy is strengthened, resident's quality of life is enhanced, and outer-area natural resource systems are protected and restored. In effect, smart growth encompasses and extends the growth management efforts of the previous decades. One expectation is that it is much more pro-growth and much less proconservation than earlier growth management efforts (APA, 1995).

Smart growth comprises the following activities (Porter, 1999):

- Control of outward movement/growth controls
- Inner-area revitalization
- Design innovations
- Land and natural resources preservation
- Transportation reorientation

For the purposes of this paper I will focus mainly on the land and natural resources preservation.

Contemporary Origins of Smart Growth

Smart growth, as presently defined, appeared in the mid- to late 1990s on a variety of fronts. Smart growth was an initiative of the American Planning Association, HUD, and the Henry M. Jackson Foundation on the one hand, and the Natural Resources Defense Council and the Surface Transportation Policy Project on the other. The APA/HUD/Jackson Foundation initiative called for updating land use controls to allow them to be sensitive to ongoing problems of lack of housing diversity, traffic congestion, environmental degradation, but most of all, the fiscal requirements of a city's infrastructure. The initiative also called for land use controls that emphasized compact development to conserve resources; limited development in undeveloped areas and encouraged investment in older central cities; promoted social equity in the face of economic and spatial separation; and were sensitive to the role of the private market and the need for simplicity and predictability in land use controls.

The NRDC/STPP smart growth effort consisted of a “toolkit” for policy makers that attempts to promote growth that is “compact, walkable, and transit accessible” and that will ultimately “compete better with sprawl in policy forums and in the marketplace” (NRDC/STPP, 1997).

Maryland adopted smart growth legislation at the state level in 1997 (Kreitner, 1998). This legislation withholds, or at least sharply limits, subsidies for new roads, sewers, or schools for political jurisdictions outside state-targeted smart growth areas. Rhode Island and Colorado have adopted similar initiatives.

In January 1999, President Clinton issued a “Livability Agenda” that contained funding for open space purchases, congestion reduction, and regional infrastructure improvements. These initiatives amounted to about \$17 billion in funding for fiscal year (FY) 2000.

Land and Natural Resource Preservation

Protecting open spaces is an important and emotional component of smart growth. The tools to accomplish this have developed over several decades (Brenneman and Bates, 1984). National, state, and local private organizations such as the Nature Conservancy, the Trust for Public Lands, and many others further open space through gift, purchase, or other means. These organizations have been abetted by other efforts; for example, states acting in the 1970s and 1980s to remove common law restrictions on conservation easements and the Tax Act of 1976 treating these easements as charitable deductions.

Government has also funded the purchase of land to keep it open. The Housing Act of 1961 provided \$50

million in grants for states and localities to acquire parks and other undeveloped land. The statement of purpose referred specifically to the need “to help curb urban sprawl” (Schultz and Kases 1984, 91). The Housing Act of 1965 increased open-space funding to \$310 million. Ultimately, categorical federal aid for open space, as for urban renewal, was folded into the block grant application approach of the Housing and Community Development Act of 1974.

A subset of open space preservation is preservation of farmland. Loss of such land has been disapproved of for years. For example, the 1981 National Agricultural Lands Study (NALS) observed that between 1967 and 1975, agricultural land had been converted to non-ag purposes at a rate of approximately 12 square miles per day (U.S. Department of Agriculture and Council on Environmental Quality, 1991).

Smart Growth also incorporates heightened sensitivity to a broad array of environmentally sensitive lands, and this too builds on the past. The 1960’s through the 1980s saw enactment of a broad array of federal legislation to promote environmental sensitivity; the Archaeological Resources Protection, Coastal Zone Management, Coastal Barriers, Clean Air, Clean Water, Endangered Species, Flood Disaster Protection, Department of Transportation, National Environmental Policy, and National Historic Preservation Acts (APA, 1995).

These public regulations reflected a changing societal perspective of land and nature. In the 1920s, the beginning point of this historical overview, wet, coastal, sloped, historic, and other “sensitive” lands were in the direct path of future development.

However, while a debate over regulations raged, the vocabulary of the disagreement changed. It was no longer an issue of whether to protect sensitive areas; rather, it was a matter of to what degree and how to balance that with other needs (Buchsbaum, 1994). This change in perspective, from society's

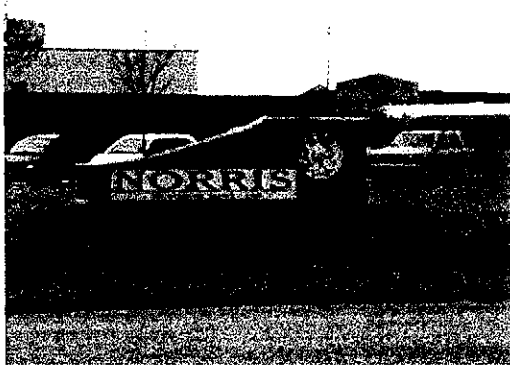
endorsement today of the need to protect it, is an important conceptual underpinning for smart growth. Indeed, contemporary smart growth works to enhance an expanded scope of the environment that goes beyond just sensitive lands to quality of life and all that it entails.

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Urbanization of Rural Lands
AGRO 889
Dr. Charles Francis

Rural Development in Southern Lancaster County:
The Effect on Norris Public Schools
By
Dean C. Lesoing



This paper is an investigation of the effect of rural development in southern Lancaster County on the Norris Public School District. The development of rural acreages and subdivisions, as well as growth in the towns within the district, has impacted the number of students that attend Norris Public Schools. This paper will examine the changes that have taken place over the years at Norris.

Norris School District #160 was formed in 1964 by the merger of the Hickman, Firth, and Roca school districts. The next year, the Cortland, Panama, and Princeton school districts merged with the new district. Classes were held in Cortland, Hickman, Firth, Roca, and Panama. Cortland had high school students, Hickman had junior high school students, and Firth, Panama, and Roca had elementary students. This was the case until a bond issue was passed in 1967 to build separate elementary and junior/senior high school buildings on 160 acres in the center of the district. The elementary building was completed for use in the fall of 1969 and the junior/senior high facility was completed in February of 1970. These were constructed on the current site of the school, but several additions have been completed since. I will document these additions later in the paper. The Norris District covers 210 square miles. Forty square miles are in Gage County, three square miles are in Otoe County, and the balance is in southern Lancaster County. Option students are also received from the Rokeby and Cheney Elementary Districts.

Lincoln and Lancaster County has experienced steady growth the last forty years. Lincoln has grown 1.42 percent per year and Lancaster County has grown 1.20 percent per year. In the period 1990 to 2000, Lincoln has grown 1.63 percent per year and

Lancaster County has grown 1.60 percent per year. Lancaster County has grown at an average rate of 1.40 percent per year when not including Lincoln in the county's growth rate. The county's towns within the district, Firth, Hickman, Panama, and Roca have grown 15.08 percent from 1990 to 2000. The township precincts of Saltillo and South Pass, in the center of the district, have a 26.5 person per square mile population density outside of the towns of Roca and Hickman. The strictly agricultural areas of the precincts have 10 to 15 persons per square mile. This means several of the sections within these two precincts have a much higher population density than the 26.5 average. These areas contain rural housing developments, large lot acreages, and rows of small lot acreages. These types of rural development have been occurring for several years in the school district, but have increased significantly during the 1990's. The Lincoln/Lancaster County Planning Commission has approved several new developments in the last few years and has strayed from the previous policy of 20 acres per house. Several rural housing developments have been built in northern Gage County over the last several years. Gage County didn't develop rural zoning regulations until the past couple of years, thence allowing several developments to be built without restrictions or county board review. The current total population in the Norris School district is approximately 6500 people.

The increase in total population brings a corresponding increase in student enrollment. Total student enrollment in 1991 was 1218. In 2003, total student enrollment is 1648. This is an increase of over 35 percent in 13 years. The following table shows the student growth over the last several years.

Table 1**ENROLLMENT AND ENROLLMENT TRENDS**

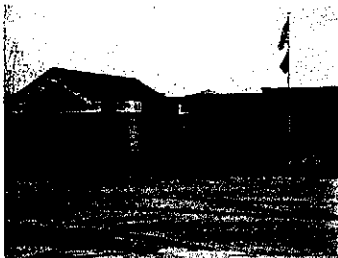
	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003
								16	17	16	13	18	20
K	86	87	96	91	88	91	110	89	100	99	88	107	119
1	96	90	94	102	93	86	100	115	92	97	105	90	110
2	87	96	95	94	104	100	96	104	115	99	98	118	106
3	105	97	104	99	100	101	91	89	102	110	103	98	125
4	115	107	100	109	98	96	103	94	90	105	123	114	106
5	96	118	108	101	120	109	97	109	99	93	112	124	119
Elementary Total	585	595	597	596	603	583	597	616	615	619	642	669	705
6	95	99	127	114	103	122	108	96	119	106	102	120	138
7	94	102	120	133	124	118	135	111	99	123	123	117	138
8	100	99	113	120	136	130	126	132	118	102	127	124	125
MS Total	289	300	360	367	363	370	369	339	336	331	352	361	401
9	73	103	96	119	124	134	129	129	136	116	106	133	135
10	102	68	98	101	121	120	134	134	122	136	118	122	135
11	84	99	70	95	99	110	117	130	133	119	132	119	117
12	85	89	98	72	95	94	95	112	126	123	108	125	119
HS Total	344	359	362	387	439	458	475	505	517	494	464	499	506
Midlands										25	15	10	36
Grand Total	1218	1254	1319	1350	1405	1411	1441	1460	1468	1469	1473	1539	1648
Contracts	3	3	4	2	2	2	3	2	3	3	3	2	3

The student growth in the Norris School district created the need to expand the facilities several times since the original buildings were built. Some of these projects were funded through the building fund and larger projects were funded through bond issues. The following is a summary of all of the new construction that has taken place over the years.

- 1. A 14,000 square foot addition to the junior/senior high school which included more area for industrial arts, music, and family consumer science classes plus several additional classrooms was constructed in 1974.**
- 2. A middle school addition consisting of office space, library, gymnasium and locker rooms, faculty room, and ten classrooms was added adjacent to the north side of the secondary building in 1979.**
- 3. Another bond issue was passed in the fall of 1988 to add five additional classrooms to the elementary building, expand the high school industrial arts area, five additional classrooms to the high school area plus a 700 seat auditorium.**

4. Outdoor athletic improvements including an all-weather track were approved by a bond issue in 1990.
5. The Board of Education used building fund money to finance another addition to the southwest corner of the elementary building in 1993. This addition houses pre-school and special education programs and includes several office areas.
6. Two more bond issues were approved in the fall of 1996 to add a gymnasium and art room to the elementary building and 6 classrooms, central office space, distance learning laboratory, and industrial technology facilities to the east side of the high school building.
7. In the fall of 2000, another bond issue was passed by residents of the district to add 10 classrooms on to the north side of the elementary building to house an all day, everyday kindergarten program as well as additional classrooms for primary grades and interior remodeling of the library/media and office areas and original kindergarten classrooms.

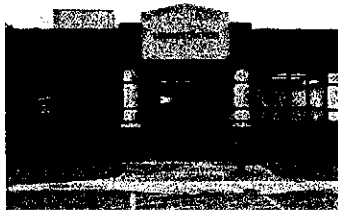
All facilities are air conditioned. The technology available to students and staff members within the school district is excellent. There are two technology coordinators, one computer for 3-4 students; all classrooms have one or more computers which are internet accessible, and many other features that make the district on the leading edge. The following pictures are of some of the additions.



Elementary



Gym



Central Administration



Middle School

With an increase in school district population and building construction, the school's budget has changed quite a large amount over the years. In 1985-86 the property tax request was for \$2,411,192 and in 2002-03 the request was \$4,293,899. Offsetting these budget increases has been a tremendous increase in the total property valuation of the district. In 1985 total valuation was \$155,333,947 and in 2002-03 the total valuation was \$436,088,253. The highest total levy on tax payers was in 1989-90 with a \$1.8480 levy per \$100 of assessed value. Today, the total levy is \$1.0472 per \$100 of assessed value and the general fund levy is \$.9024. The school district benefits from the state aid formula due to its continued growth. The following table shows the trends since 1985.

Table 2
ASSESSED VALUATION FOR NORRIS SCHOOL DISTRICT 160 AND TAX LEVY

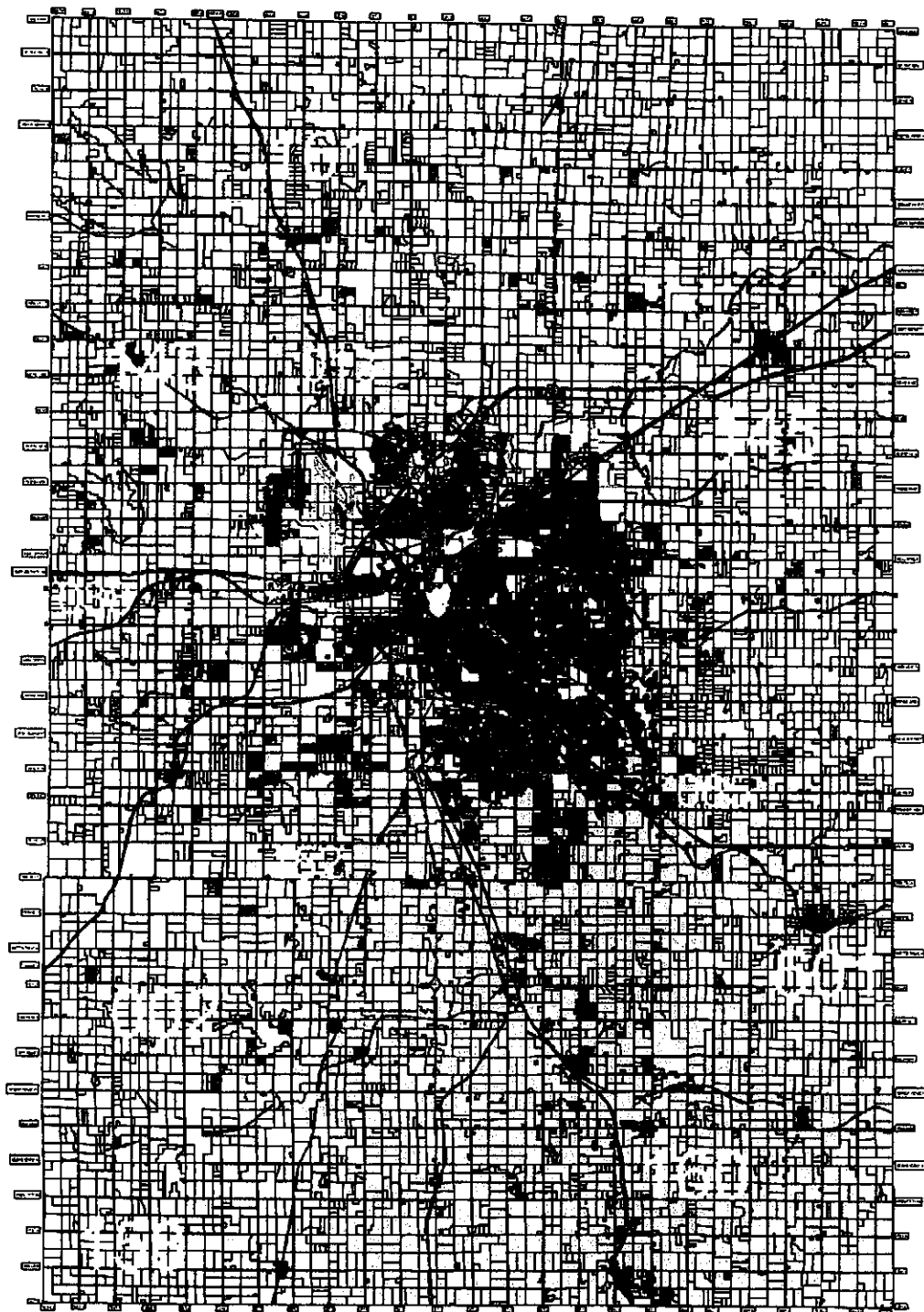
School Year	Actual Property Valuation of the School District	Percent of Increase or Decrease from Previous Year	General Fund Levy/\$100 Actual Value	Bond and Building Fund Levy per \$100 Actual Value	Total Levy per \$100 Actual Value	General Fund Property Tax Requested
2002-03	\$436,088,253	2.69	0.9024	.1448	1.0472	\$4,293,899
2001-02	\$424,682,871	10.58	0.9000	.1418	1.0418	\$4,212,539
2000-01	\$384,009,180	4.24	0.9900	.0728	1.0628	\$4,200,719
1999-00	\$368,374,537	15.85	0.9543	.0528	1.0071	\$4,004,241
1998-99	\$317,078,142	8.70	0.9900	.0523	1.0430	\$3,521,208
1997-98	\$292,530,896	-.063	1.1236	.2109	1.3345	\$3,983,167
1996-97	\$294,380,027	5.82	1.0685	.2234	1.3037	\$3,930,417
1995-96	\$278,194,541	5.38	1.0668	.2369	1.3000	\$3,755,366
1994-95	\$263,997,317	27.22	1.0504	.2496	1.5904	\$3,551,785
1993-94	\$207,514,563	2.51	1.2870	.3034	1.5095	\$3,390,122
1992-93	\$202,434,358	2.05	1.2514	.2581	1.4365	\$3,104,126
1991-92	\$198,367,589	1.49	1.1896	.2469	1.3674	\$2,849,565
1990-91	\$195,460,653	2.09	1.1142	.2532	1.6796	\$2,672,813
1989-90	\$191,370,543	22.62	1.4742	.2054	1.8480	\$2,214,150
1988-89	\$156,070,569	.39	1.5972	.2508	1.7471	\$2,884,265
1997-88	\$155,454,777	3.22	1.4952	.2518	1.7170	\$2,715,878
1986-87	\$150,606,600	-3.04	1.4571	.2599	1.5523	\$2,585,870
1985-86	\$155,333,947	3.60	1.3011	.2512	1.5365	\$2,411,192

The Board of Education and administration have been in the forefront in planning for growth since the first day Norris was formed. Today, the Board must plan the next step. This could be constructing a separate middle school building, adding on existing facilities, or a number of possible solutions. The future depends on many factors such as the state aid to education formulation, possible future annexation of parts of the district by Lincoln Public Schools, and the desires of district patrons who have to foot the bill for the school system.

The effect of rural development on the Norris School District can be seen as a positive influence. The growth in property valuation has helped spread the cost of educating the students over a larger amount of property owners. The school's tax levy is envied by most school districts across the state. The growth has shown benefits in the quality and variety of education that is offered to the students. The bottom line is, the vision of school board members and administrators have had over several years has allowed the Norris School District to grow and expand in an efficient and productive manner. Those individuals who first consolidated the original school districts had no idea that Norris would grow to where it is today, but their forward thinking put the district in a great position to handle the growth.

The negative effects of rural development can be many. The demand for water, changes in farming practices, road maintenance, and increases in farmland prices are just a few. Several more papers could be developed on each of these topics.

Lancaster County School Districts Affiliated Map



District Boundaries
District 1
District 2

District 3
District 4
District 5

Lancaster County School Districts

District 6
District 7
District 8

District 9
District 10
District 11

District 12
District 13
District 14

District 15
District 16
District 17



REFERENCES

- **www.norris160.org– School Website**
- **Scott Wieskamp – LPS, Map of Lancaster County School Districts**
- **City of Lincoln/Lancaster County Planning Department Website**
- **Larry Grosshans – Norris Public Schools Assistant Superintendent**
- **U.S. Census, 2000 and 1990**

Urbanization of Rural Landscapes, Spring Semester 2003, Wed 6-9 pm, 234 Keim Hall, 3 credits

**AGRO 489 (#1312), AGRO 889 (#1335), AECN 896 (#1171), AGRO 489c Sec.141 (#1313)
CRPL 489 (#2694), CRPL 889 (#2710), HORT 489 (#4509), HORT 889 (#4518)
AGRO 889c Sec.141 (#1336)**

Overview & Course Goals:

Each year more than 1.4 million acres of rural lands in the U.S. are converted to housing, roads, and other development. Far more acres are influenced as development fragments landscapes, speculation drives up land prices, and production agriculture is pushed onto more marginal lands. This process forces changes in agriculture, rural landscapes, and human communities. Landscape functions such as agricultural production, water quality, biodiversity, climate, aesthetics, and recreation potential are greatly reduced. *Urbanization of Rural Landscapes* is a multi-disciplinary, experiential course that guides students in learning about this process and its impacts. The goals are to build an understanding of the factors that cause urbanization, the impacts on agriculture and society, and the choices that are open to informed citizens. Discussions in the course encourage a wide range of opinions and an open mind.

Learning Objectives: A student or observer who completes this course will be able to

- Describe the patterns and impacts of land conversion, and the major factors that influence land use decisions in the U.S. and elsewhere.
- Access internet and other information resources on land use policy, farmland preservation, and alternative development strategies.
- Demonstrate familiarity with land use planning tools, policies, and procedures, and practice these in a local development scenario.
- Participate in community debates on land use issues and contribute to public understanding of the issues and impacts of urbanization.
- Communicate with different audiences through multiple channels: letters to the editor, book reviews, project reports to various client groups; pursue action education in a learning community.
- Specific learning objectives are listed for each class session.

Logistics of Course:

Urbanization of Rural Landscapes will meet Wednesday evenings from 6 to 9 pm from January 15 to April 30, 2003. Our learning community will experience lectures, small and large group discussions and activities, demonstrations, invited resource people from several disciplines, field trips, and individual semester projects. Each class meeting will include:

- 6 – 7:15 Invited speaker and discussion of key topic
- 7:15 – 7:30 Break and informal discussions
- 7:30 -- 8:50 Group activities, decision cases, discussion on key topic & projects

Motivation will be provided through weekly exercises, one book review, two midterms and an individual semester project presentation and written report. Self-evaluation will be supplemented by peer and faculty review of activities. Participants from the community bring a rich experience to the course, and we invite them to participate in all activities of interest. All assignments and most resource material will be on a blackboard site for the course, supplemented by web sites and library, plus people in the community.

References: The text for the course is *Under the Blade: the Conversion of Agricultural Landscapes*, Richard Olson and Thomas Lyson, editors, Westview Press, Boulder, Colorado, 1999. This will be supplemented by literature articles, book chapters, popular press, web sites, current reports on local issues and activities, maps and software on Lincoln, Lancaster County, Nebraska, and the U.S. Students will contribute to this resource base through their book reviews, projects on specific topics, and internet searches that will be shared with the class.

Green Book, Volume 13 : One major output from the learning community this semester will be a compilation of student project work – including letters to the editor, book reviews, and project reports – to be published in the Green Book Series, *Extension and Education Materials for Sustainable Agriculture, Vol. 13* (June 2003). (1) Letters to the Editor on a topic relevant to the course and chosen by each student will be due Jan. 29 (draft), then edited by other students and instructors, and final version due Feb. 12. This letter may be submitted to a newspaper at the discretion of students. (2) Book reviews from the titles provided in the course or others chosen by students will be due Feb. 26 (draft), then edited by other students and instructors, with final version due Mar. 12; this can be submitted to an appropriate publication outlet if a student chooses to do so. (3) Final project reports will be presented in class on April 16, 23, and 30, and the final written version due on April 30. These will be evaluated and edited by fellow students and the instructors. Students are also welcome to publish these reports if an appropriate forum can be found. Since all three items from each student will be included in the Green Book, this will constitute an informal “miscellaneous publication,” edited by peers and instructors, with a volume and page number assigned; it would be appropriate to include this in your personal resume. Having these materials in a class compilation does not preclude their publication in some other place for formal recognition and a wider distribution. To maximize accessibility of these materials to future students, and to make them available on a web site, we require both hard copy and electronic version of each letter, review, and project report. You will be mailed a copy of the completed book. Editors of the Green Book will be Mindi Schneider, Dixon Esseks, and Charles Francis.

Grades:	Letter to Editor	5%	(see examples on Blackboard)
	Draft Jan 29, Final Feb 12		
	Book Review	15%	(see examples on Blackboard)
	Draft Feb 26, Final Mar 12		
	Midterm Exam I	20%	(take-home exam)
	Due Feb 19		
	Midterm Exam II	20%	(take-home exam)
	Due Mar 26		
	Final Project Report	40%	
	Due Apr 30		

Instructors: Charles Francis, 225 Keim (472-1581) cfrancis2@unl.edu
Dickson Esseks

Teaching Assistant: Mindi Schneider, 355 Keim (472-1596)

Course Schedule, Topics, Specific Learning Objectives; Spring 2003:

- Jan 15** **Introduction to Course & Learning Community, Information Resources, Perspectives on Farmland Loss in U.S. (Chuck Francis, Dickson Esseks)**
Learning Objectives:
- Articulate the nature of farmland loss and its implications
 - Access and interpret information resources on urbanization of farmland
 - Integrate a learning community
- Activities:** Building a Learning Community, Discuss Projects, Sense of Place
Ref: Introduction, Under the Blade, p. 1-13
- Jan 22** **Magnitude of Farmland Loss in the U.S.: What is the Challenge? How Do We Measure Farmland Loss and What Does This Mean? (Dickson Esseks)**
Learning Objectives:
- Describe the extent of farmland conversion in U.S.
 - Access and interpret available statistics on farmland conversion
 - Long-term implications of farmland conversion to other uses
- Activities:** Establishing Criteria for Evaluating Land Change Impacts, Gallery Walk
Ref: Under the Blade, Ch. 1, p. 15-51
Census of Agriculture:
National Resources Inventory:
Analysis of NRI data:
- Jan 29** **Human Motivations and Choices about Urbanization (Jamee Wolfe)**
Learning Objectives:
- Explain personal motivations for land conversion
 - Understand individual motivations in context with society needs
 - Explore cultural differences in human motivations
- Activities:** Case Study on Motivations of Rural and Urban Families, Case Debate
Ref: Durning, Alan. 1992. How Much is Enough?: The Consumer Society and the Future of the Earth. New York: W.W. Norton & Company.
Schor, Juliet B. 1991. The Overworked American. BasicBooks, a division of HarperCollins.
Schor, Juliet B. 1998. The Overspent American. Harper Perennial, a division of HarperCollins.
- TV-Free American –
Center for a New American Dream –
New Road Map Foundation –
The Media Foundation –
- Due: Draft Letter to Editor**
- Feb 5** **Landscape Structure & Function, Impacts of Development (Chuck Francis)**
Learning Objectives:
- Explain the importance of landscape structure to its ecological functions
 - Describe the impacts of farmland conversion on these multiple functions
 - Explore development alternatives to preserve multifunctional landscapes
- Activities:** Team Case Study: Prairie Crossing, Telephone Interview with Ranneys
Ref: Under the Blade, Ch. 2, p. 53-95; Exploring Diversity, Ch. 6, p. 121-160
For Prairie Crossing Interview:

- Feb 12** **Innovative Planning of Urban/Rural Landscapes: Community Perspectives (Cecil Steward)**
Learning Objectives:
- Explain farmland conversion in terms of regional and urban development
 - Explore alternatives to current development efforts
 - Understand community foundation activities in sustainable development
- Activity:** Group Presentations on Case Study: Prairie Crossing Case Debate
Due: Final Letter to Editor; Discuss topics on midterm exam & hand out Midterm I
Ref: Joslyn Castle Institute:
- Feb 19** **Economics of Urbanization & Landscape Conversion (Ray Supalla)**
Learning Objectives:
- Explain the economics of individual landowner decisions to convert farmland
 - Discuss the short-term and long-term economic impacts to society
 - Describe alternative valuation criteria for evaluating rural landscapes
- Activities:** Class Debate on Development Impact Fees, Discuss Midterm I
Ref: Under the Blade, Ch. 4, p. 137-180
Due: Midterm Exam I
- Feb 26** **Legal Dimensions of Planning and Land Use (Joe Luther)**
Learning Objectives:
- Describe the laws that influence and impact farmland use
 - Explain the role of zoning at local level and farmland use and conversion
 - Explore alternatives for future legal protection of farmland
- Activities:** Presentations and discussions of book reviews, Class Evaluation I
Ref: Under the Blade, Ch. 3, p. 97-136
Due: Draft Book Review
- Mar 5** **City/County Planning Process: Lincoln & Lancaster County, Nebraska (Mike DeKalb)**
Learning Objectives:
- Explain the process of local, coordinated planning activities
 - Describe the complexity and competing interests in Lincoln/Lancaster Co. plans
 - Design a planning approach that is inclusive, comprehensive, and long-term
- Activities:** Design of an Urban/Rural Planning Process,
Ref: Lincoln – Lancaster County Master Plan
Ref:
- Mar 8** **Field Trip: Lancaster, Saunders, Washington, Douglas Counties: A Close-Up Encounter with the Urban/Rural Interface; Leave Keim Hall 7:30 am, return 4 pm**
Learning Objectives:
- Describe the development directions and farmland conversion in E. Nebraska
 - Explain the competing interests and pressures for farmland conversion
 - Explore alternatives for sustainable development and farmland preservation
- Mar 12** **Building Consensus in Ecological Planning (Kip Hulvershorn)**
Learning Objectives:
- Understand the planning process and competing local interests
 - Describe the process of conciliation and meeting community objectives

- Explore methods for articulating long-term individual and society goals
- Ref:** "Consensus - How and Why"
"Wilderness Park and Subarea Plan"
"Greenprint"
- Arnstein, Sharri R. "A Ladder of Citizen Participation." American Institute of Planners Journal, 35 (July 1969): 216-224
- Daniels, Steven E., and Walker, Gregg B. Working Through Environmental Conflict: The Collaborative Learning Approach. Westport, Conn: Praeger Publishers, 2001. UNL: GE180 D36 2001
- Activities:** Discuss farmland options in Lincoln-Omaha Metro Region, Hand out midterm exam II, Hand out farmlands attitude interview format. **Due: Final Book Review**

Mar 26 Long-term Community Planning & Transportation Alternatives (Jim Linderholm)

Learning Objectives:

- Describe the competing interests and multiple impacts of transportation plans
- Discuss the process of building community consensus
- Describe the economics of alternative choices for the long-term future

Activities: Discuss farmlands attitude interview results, Discuss Midterm II

Ref: Environmental Impact Statement, Beltway Plan **Due: Midterm II**

Ref: Beltway Maps:

Mar 29 Optional Field Trip: Konza Prairie, south of Manhattan, Kansas (interested people may join the Agroecology 435/835 class for a van trip, prairie tour with grazing bison, soil testing exercise, and individual prairie walks; leave Keim Hall 7 am, return 6 or 7 pm.

Learning Objectives:

- Examine and discuss the importance of preserving prairie habitat in the Midwest
- Understand the native ecosystem and roles of indigenous animals and plants

Apr 2 National Policy for Farmland Use & Preservation (Dick Esseks)

Learning Objectives:

- Describe the current national policy and its impacts on conversion
- Discuss future alternative policies and their long-term implications
- Explore the processes that could be used to establish rational policy

Activities: Debate on national policy alternatives, Class Evaluation II

Ref: Under the Blade, Ch. 7, p. 247-268; Farming on the Edge, see web site
American Farmland Trust:

Apr 9 Ethics & Aesthetics of Farmland Conversion (Richard Sutton)

Learning Objectives:

- Discuss the ethical dimensions and aesthetic implications of land conversion
- Describe the competing individual and societal goals and their impacts
- Understand visual tools for planning and their applications

Activities: Tools for Visualization in Planning, (Gary Bentrup)

Ref: Under the Blade, Ch. 6, p. 217-246; review: A Sand County Almanac (Leopold)

Apr 16 Project Reports & Discussion (6 reports, 30 min each)

Learning Objectives:

- Prepare and present an oral summary and lead discussion on project
- Practice listening, analysis, and evaluation skills to provide feedback to speakers
- Prepare final project summary for including in Green Book, Volume 13

Activities: Prepare and hand in evaluations of individual presentations

Apr 23

Project Reports & Discussion (6 reports, 30 min each)

Activities: Prepare and hand in evaluations of individual presentations

Apr 30

Project Reports & Discussion (6 reports, 30 min each)

Activities: Prepare and hand in evaluations of individual presentations

Due: Written Project Reports (Final); Class Evaluation III